From 8278247622735869451
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,8579122a0a90d5b3,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-06-02 17:32:26 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10 5/3/83; site mtunh.UUCP
Path: utzoo!watmath!clyde!bonnie!akgua!whuxlm!harpo!decvax!tektronix!uw-beaver!
cornell!vax135!ariel!mtunf!hou5e!mtx5d!mtunh!jak
From: jak@mtunh.UUCP (Jim Kutsch)
Newsgroups: net.ham-radio.packet
Subject: Gateway V.1 No.20
Message-ID: <453@mtunh.UUCP>
Date: Sun, 2-Jun-85 20:32:26 EDT
Article-I.D.: mtunh.453
Posted: Sun Jun 2 20:32:26 1985
Date-Received: Fri, 14-Jun-85 00:23:51 EDT
Organization: AT&T Information Systems Laboratories, Holmdel, NJ
Lines: 398

Gateway: The ARRL Packet-Radio Newsletter
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 Editor:
 Jeffrey W. Ward, K8KA

 CALIFORNIA PACKETEERS PARTICIPATE IN "QUAKE '85"

 A simulated earthquake occurred on April 16 in southern
 California. The simulated quake was 8.2 on the Richter Scale.
 A quake of this size would cause a great deal of destruction and
 would most likely result in the immediate loss of most
 communications over a large area for several hours. As is the
 case for most large-scale exercises of this type, amateur radio
 played a part. This year, for the first time, packet radio made
 major contributions.

 The goal was an ambitious one: to move traffic from the State
 Office of Emergency Services (OES) communications trailer in Los
 Alamitos to the OES office in Sacramento, 400 miles to the north,
 using VHF. This required the use of seven digipeaters. We
 learned several things during the exercise: First, it is
 possible to move a large amount of traffic that distance through
 that many digipeaters, and second, it wasn't possible to do it in

the way we had originally intended.

We also had several unplanned events preceding and during the exercise which added to the simulated emergencies. First, California is blessed with a geography that provides 4000 to 8000 foot mountains and over-water paths. The length of most of the paths used in the network (called WESTNET) is 90 miles, with one path of 120 miles and another close to 200 miles. The longer paths require over-water ducts, which are in place for much of the year. Two days before the exercise, a weather pattern went through that destroyed the ducts, which didn't return for several days.

Also, three digipeaters failed the day before the exercise. This was the largest network failure experienced before or since. The systems were repaired in hours, and portable systems were readied. During the exercise, one system was driven to a mountain top to supply backup for the lost duct, and another system was "car mobile" at the OES site, ready to be driven or helicoptered should the need arise.

In addition to the amateur-owned equipment in place, the OES had previously purchased several TNCs; one was installed in their communications van in Los Alamitos and another in their office in Sacramento. A third was at an intermediate digipeater site in northern California. To make a long story short, soon after the exercise began, we established communications with Sacramento. Unfortunately, it was lost soon after, because of a flaky path at the far northern end. We didn't find this out until much later, of course. We interspersed an hour of attempted reconnects up north with passing traffic around the southern California area - San Diego, Santa Barbara, Glendale and others. This activity was very successful. After it became apparent that we couldn't stay connected to Sacramento, the goal became to get the traffic as close to there as possible. We sent several CQ messages to San Francisco, which was outside of the simulated affected area, and attracted the attention of a ham with file store capabilities. We transferred two hours of accumulated traffic in short order to San Francisco, through four digipeater hops. The San Francisco station then transferred the traffic to the Sacramento station though two hops, again with little difficulty. Later in the afternoon as the paths improved, we were able to transfer traffic directly to Sacramento.

We learned these lessons during the test: First, two teams are needed at the packet position in the communications trailer. One team establishes and maintains the link, the other enters the traffic on a separate computer system. When a link is available, the data can be moved quickly by moving a disk from the data-entry computer to the computer with the TNC attached. During the "quake," even though two computers were available, message traffic piled up in the "IN" basket while we were trying to establish a path. Once contact was made with the San Francisco

station, it took half an hour to clear the backlog. It would have taken less than five minutes had the data already been entered on disk.

We also learned that it would have been better if we had planned on an intermediate file relay station part way up the link in the first place. The cumulative effects of dropped packets increases with number of digipeaters until the probability of a packet making it all the way to the end and the ACK getting all the way back becomes small. In our case, four hops was 90% reliable (one packet not ACKed in 10), but seven hops was less that 10% reliable. Had we sent all traffic with to the intermediate station in San Francisco, we could have passed the traffic as it came in, instead of building up a large backlog.

Finally, we learned that it was possible to pass traffic a long distance through a large number of digipeaters, provided that we did it the right way. It was possible to maintain a clear channel; people with non-simulated-emergency traffic stood by or went elsewhere. We also learned that as with other types of emergency exercise, success depends on planning and on the hard work of many amateurs.

At the risk of leaving someone out, here is a list of the packet participants in "Quake 85" -- keyboarders, mountain-toppers, HQ and other office station setup, north and south: KA6SOX, W1UUQ, WA6CFM, WD6FPY, WB6DAO, W6IXU, N6BGW, N6CXB, NK6K, AJ6T, WB6UCK, N6ZH, NG6P, K6QIF, KB6JM, WB6HHV, W6AMT. There were 6 packet stations directly involved with traffic handling and 10 digipeaters involved in the network.

From NK6K.

IBM PC PACKET ADAPTER

Jack Botner, VE3LNY, whose article "A Packet Radio Adapter for the IBM PC" appeared in the January 1985 issue of QEX, has received many inquiries concerning software for his 8273 HDLC adapter. He reports that an implementation of the VADCG protocol is available from the Hamilton Area Packet Network (HAPN). The protocol software is written in assembler, and the support programs are written in C. To receive the software, send $15, a diskette and a disk mailer to:

Jack Botner, VE3LNY
35 Wynford Hights Circle #1708
Don Mills, Ontario
CANADA M3C 1L1

Software supporting the AX.25 protocol is not yet available for Jack's adapter. HAPN would like to hear from anyone interested in developing AX.25 software for the interface.

From VE3LNY.

COLLECTION OF PACKET PAPERS

If you have been reading any of the books recommended in Gateway, you have probably noticed that a few "classic" papers on packet switching are referred to over and over. Tutorial Principles of Communication and Networking Protocols, edited by Simon S. Lam is a comprehensive collection that includes many of these essential papers on digital communications. The papers cover link protocols, multiple access methods, local-area networks, resource allocation in networks, network and internet services, and protocol verification. The collection is published by The Institute of Electrical and Electronics Engineers (IEEE), and it is ISBN 0-8186-0582-0.

Via KA9Q.

PACSAT FUNDING

As reported in Gateway 15, the Radio Amateur Satellite Corporation (AMSAT) and The Volunteers in Technical Assistance (VITA), have completed engineering specifications for PACSAT, a proposed store-and-forward, packet-radio satellite. In the two months since the design and strategy meeting, no sources of the necessary funding have been identified. Recently, VITA was granted several thousand dollars to retain a professional fund raiser for the PACSAT project. While this should help, it is still important that amateurs assist by identifying potential sources of major contributions. Also, as in past amateur-satellite projects, individual and club donations to the PACSAT fund will be necessary. If you can help, contact:

VITA
1815 N. Lynn
Arlington, VA 22209
Attn: Gary Garriott, PACSAT Project Manager

Ed.

JAS-1 PACKET INTERFACE

The April issue of the Japanese magazine CQ Ham Radio has an article by JA1ANG, based on material from Miki Nakayama, JR1SWB, describing the user interface to the packet mailbox that will fly on the JAS-1 satellite. It shows a sample message from W3IWI to JR1SWB as it would be received at JR1SWB and then a reply. The dialog shown in the magazine is reconstructed below:

(Legend in left-hand column:

```
$: JAS-1 ==> User
%: User  ==> JAS-1
&: TNC  <==> User)

& cmd:CONNECT JAS-1
& *** CONNECTED to JAS-1

$ Hello JR1SWB de JAS-1
$ Your last access was on 85/01/11 at 1922 UTC

$ NO. DATE   FROM   TO      SUBJECT         LINES
$ 15  01/28  W3IWI  JR1SWB  AX.25 SOFTWARE  3

$ Command ?

% READ 15

$ Posted: Mon 85/01/28 From:   W3IWI
$ To:     JR1SWB
$ Subj:   AX.25 SOFTWARE
$ I have the disks ready to mail to you and the
$ packet is all sealed. $    Tom

$ COMMAND ?

% WRITE W3IWI

$ Subject:

% Re: AX.25 SOFT.
$ Text:

% Tom, I'm looking forward to receiving the
% packet.
%    73's  Miki
% .

$ Message from JR1SWB to W3IWI saved as #18
$ COMMAND?

% BYE

& *** DISCONNECTED
```

This protocol is a combination of features of the W0RLI MailBox (JR1SWB has a Xerox 820 and is running the MailBox) and of TeleMail (the message in the example was sent via TeleMail). JAS-1 is scheduled for launch in 1986. Uplinks will be on 2 meters (145.85, .87, .89, .91 MHz) with a single downlink on 70 cm (435.91 MHz) using 1200 bauds, phase-shift keyed (PSK).

From W3IWI.

SIGHTLESS HAM ON PACKET RADIO

April 25, 1985 marked an important event for the Rochester packet-radio fraternity. 1985 has seen rapid growth of packet in the Rochester area, but the highlight has to be the appearance on packet of Walt Keleher, KA2ASL. What's so unusual? Walt is blind.

Operating on voice or CW without sight presents some challenge, but think about operating on packet radio without your sight. Sending is not a big problem, since Walt can touch type, but receiving is another story. Walt has an Apple IIe computer, an Echo voice synthesizer and a specially developed terminal program. This terminal program unites the computer/terminal and the text-to-speech functions of the synthesizer or "talker." Whatever appears on the screen of the computer is "read" by the talker, in nearly perfect speech. If pronunciation errors are made, Walt can back up to get a repeat or to have the unit spell out the unknown word or phrase.

On the evening of April 25, Dave Denz, N2DWL, and Mark Winrock, both members of the Rochester packet group, went to Walt's home and set up his TNC and radio. After a short period of instruction and coaching, the big moment arrived. The equipment worked perfectly. Walt worked WB2NBU, K2YNW and W2DUC in rapid succession. While Walt was taking his time learning about packet operation, the rest of the gang was taking turns sending to him. Walt reports that we are perfect copy, but all seem to have a Swedish accent (a common trait of text-to-voice processors).

It was exciting evening, introducing Walt to packet radio and helping willpower overcome a great barrier.

From W2DUC.

CONTACTS IN THE SOUTH

At a recent packet-radio forum at the Baton Rouge, Louisiana hamfest, several amateurs from Louisiana and Mississippi expressed the need for better communications among the scattered centers of packet radio in the southern U.S. If you are interested in helping connect the western reaches of "SOUTHNET," write:

Ken Shutt, K5GUU
12433 Archery Dr.
Baton Rouge, LA 70815

or

Alan Clark, WD5IKD

2325 Milam Street
Pearl, MS 39208.

In areas where packet stations are few and far between, it is important that those who are on the air or interested in getting started can get in touch with others who've been bitten by the packet bug.

Via WD5IKD, K5GUU.

INTERMOUNTAIN REPORT

Dave Pedersen, N7BHC, of the Utah Packet Radio Association (UPRA), recently gave a packet-radio introduction and demonstration to more than thirty people in Boise, Idaho. There are several packet stations under construction in Boise. Dave, located in Salt Lake City, Utah, reports that he has been able to make a 300-mile direct connection with Jeff Bishop, W7ID, in Boise. Unfortunately, the path is not quite solid on 2-meter FM. Dave and Jeff regularly hold 2-meter SSB skeds, and they hope to try some SSB packet (real FSK instead of AFSK on FM) soon. A digipeater link between Salt Lake City and Boise should be completed this summer.

From N7BHC.

HF PACKET

If your VHF packet network is getting a bit crowded or you just want to try out another facet of packet radio, connect your TNC to your HF rig and give HF packet a try. HF packet stations transmit at 300 bauds, using a 200-Hz shift. While some stations are using Bell 103 modems modified to transmit and receive on one set of tones (simplex), any 200-Hz shift modem can be used. If your transmit tones are the same as your receive tones, just tune in another station and you're on your way. Packet-radio employs NRZI encoding, so which sideband you use is not important. Most of the HF packet activity is on 30 and 20 meters, with 10.147 MHz and 14.102 MHz the popular frequencies. The following stations are running the W0RLI GateWay software on HF packet: KI0Q, Ames, Iowa; N4CI, Conyers, Georgia; KF4JF, Hahira, Georgia; K7PYK, Scottsdale, Arizona; WA4SZK, Florence, South Carolina; W0RLI, Westport, Massachusetts; KD6SQ, Cucamonga, California; KA1PN-1, Nashua, New Hampshire. Hank Oredson, W0RLI, reports that a new GateWay station comes on the air each week. So, slow down your TNC and narrow your modem to try HF packet.

Via W0RLI.

TAPR "OLD BUSINESS DAYS"

From Monday, May 20, through Friday, May 31, 9:00 AM until 5:30 PM PST, TAPR will double its office staff and disconnect the telephone recorder. During this time they will have a human answering the phone, and they will be returning the backlog of calls that has built up.

What exactly is "Old Business Days"? It's a marathon session during which TAPR hopes to clear out the last loose ends of the TNC-1 product line. Call if you have any outstanding business with TAPR regarding any of the following items:

    TNC-1 Kits
    TNC-1 cabinet kits.
    Beta Upgrade kits.
    Outstanding spare parts orders.

Also take this opportunity to order spare or replacement parts for TNC-1.

If you are calling about a backlog order, please have the date of the transaction available and information on the method of payment. If you call after hours, you will get the answering machine; Please leave a number where you can be reached during the day.

Please do not call about any of the following items:

    Orders for TNC-2
    New TNC-1 kit or cabinet orders
    9600-bit/s modems
    TNC software or hardware questions

Both TNC-2 and the 9600-bit/s modem boards are in beta test now. TAPR will begin taking orders when they are available.

The TAPR phone number is (602) 746-1166.

    From NK6K.

REPRODUCTION OF GATEWAY MATERIAL

Material may be exerpted from Gateway without prior permission, provided that the original contributor is credited and Gateway is identified as the source.

From -924372382805385789
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,4717a5b3c412dc8a,start
X-Google-Attributes: gid11bd51,public

X-Google-ArrivalTime: 1985-06-22 00:38:24 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site sdencore.UUCP
Path: utzoo!linus!decvax!ittvax!dcdwest!sdcsvax!sdencore!mark
From: mark@sdencore.UUCP (Mark DiVecchio)
Newsgroups: net.ham-radio.packet
Subject: Request for Packet Tutorial
Message-ID: <122@sdencore.UUCP>
Date: Sat, 22-Jun-85 03:38:24 EDT
Article-I.D.: sdencore.122
Posted: Sat Jun 22 03:38:24 1985
Date-Received: Mon, 24-Jun-85 07:50:23 EDT
Organization: Encore Computer Corp., San Diego
Lines: 7

There are some of us out here who know very little about
packet radio (I know at least one - me). If anyone can post
some tutorial information, it would be much appreciated.
--
Mark C. DiVecchio
K3FWT
[ihnp4|akgua|decvax|dcdwest|ucbvax]sdcsvax!sdencore!mark

From -4853970295366821695
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,fb32ff6c41583870,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-15 13:52:49 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 (Denver Mods 7/26/84) 6/24/83; site drutx.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!harvard!talcott!panda!genrad!decvax!
tektronix!hplabs!qantel!ihnp4!drutx!bray
From: bray@drutx.UUCP (BrayJM)
Newsgroups: net.ham-radio.packet
Subject: does this exist?
Message-ID: <3252@drutx.UUCP>
Date: Mon, 15-Jul-85 16:52:49 EDT
Article-I.D.: drutx.3252
Posted: Mon Jul 15 16:52:49 1985
Date-Received: Sun, 21-Jul-85 02:27:04 EDT
Organization: AT&T Information Systems Laboratories, Denver
Lines: 5

are there really any articles being posted to this group? nothing seems
to show up here. hello world.

john bray,kb6ql
attis-dr : UUCP: ...!ihnp4!drutx!bray

From -3459795262719448839
X-Google-Language: ENGLISH,ASCII-7-bit

X-Google-Thread: 11bd51,356a2ffe52a9b8e4,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-20 20:11:35 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!decvax!genrad!mit-eddie!bcn
From: bcn@mit-eddie.UUCP
Newsgroups: net.ham-radio.packet
Subject: net.ham-radio.packet
Message-ID: <4746@mit-eddie.UUCP>
Date: Sat, 20-Jul-85 23:11:35 EDT
Article-I.D.: mit-eddi.4746
Posted: Sat Jul 20 23:11:35 1985
Date-Received: Sun, 21-Jul-85 23:28:54 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 13

From: Clifford Neuman <bcn>
The packet radio mailing list is now linked to the Usenet news group
net.ham-radio.packet. The link from the mailing list to the news group
is direct, but because of problems I have seen with other news groups,
the link from the news group to the mailing list will be moderated. I
will try to remove messages like "Does/should this news group exist?"
and messages which are followups to the wrong group, etc.

For those people receiving the mailing list via UUCP, after a few weeks
to make sure everything is stable, you may want to be removed from the
mailing list to reduce the UUCP traffic though eddie's neighbors.

     ~ Cliff (N1DMM)

From 3264841060720535024
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,37d2f9d0fa53cc3e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-24 20:54:36 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!harvard!think!mit-eddie!
KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: surplus power supply
Message-ID: <4775@mit-eddie.UUCP>
Date: Wed, 24-Jul-85 23:54:36 EDT
Article-I.D.: mit-eddi.4775
Posted: Wed Jul 24 23:54:36 1985
Date-Received: Fri, 26-Jul-85 03:57:56 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 428

From: HaymakerLL <llh%drutx.uucp@BRL.ARPA>
The following is a letter to convert the switcher powersupply for use in Packet Radio to allow the TAPR TNC to be used on 12VDC. The TNC is a small 6809 based processor with a total current draw of around 800ma. This supply was used in packet radio use, but we have used it in other applications, with good results. I might add that this supply has been in use for better than six months with no problems, and we have sent out about 200 requests for the schematic with no negative feedback.

12 VDC POWER SUPPLY FOR TNC BOARDS

Packeteers in Colorado have adapted a surplus power supply board for use with the VADCG and TAPR TNC's. The supply is made by Iriichi Tsushin Kogyo Ltd., part no. 10053214-2. It is available from several sources, including Radio Shack (#277-1016) and BNF Enterprises (#4NS0427). Our modifications to the supply will convert the -5V output to -12V (as required by the TNC), and will allow it to operate from 10 to 15 volts DC (permitting construction of portable packet stations and digipeaters operating from a 12 volt battery).

Some changes to the TAPR boards will be required, particularly on the older board layouts, to ensure compatibility with the new supply. VADCG boards work without modification, since they were designed for use with an external power supply.

These modifications have been broken down into several parts, so that you may perform only as much as necessary for your particular application. For a copy of the schematic and of these instructions, send a business size SASE with 1 once postage to: RMPRA -- Power Supply Experiments, 3775 E 115th Ave, Thornton CO 80233

**** DISCLAIMER ****

This information is a report on the methods and results of the authors' experiments. The modifications we used were not developed by the power supply manufacturer, the Vancouver Amateur Digital Communications Group, or by Tucson Amateur Packet Radio Corporation. Their approval of these modifications is not implied by our use of their products. We present our results for the information and assistance of others interested in this work; it is still in EXPERIMENTAL stages and those who attempt to duplicate our results assume all risks of doing so.

PRECAUTIONS
**** For All Applications ****

1. Read this procedure through and be sure you understand it, then do the job carefully. The switching power supply is a more complicated and less forgiving device than the three-terminal regulators it replaces.

2. Test the supply with dummy load resistors BEFORE attaching it to the TNC. If there is a defect, you don't want to find it by blowing out the expensive LSI chips on the TNC board!

3. Use a fuse on the supply input lead. The switching supply has NO other protection from excessive current. When testing and connecting the switching supply, do not, ever, short the output leads.

CONVERTING -5V OUTPUT TO -12V
**** For All Applications ****

Remove C14 (1000 UF, 10 V) and replace it with a capacitor rated 470 UF, 16 V (Radio Shack 272-957). Be sure

to install C14 with the correct polarity (all the electrolytics have "-" facing the same direction). The reason for replacing C14 is that the 10 V rating will be exceeded, and the capacitor would be likely to fail prematurely. The replacement part must have a body diameter of 1/2 inch (13 mm) or less, and lead spacing of .20 inch (5 mm), or it won't fit onto the PC board. Check the part before you buy it, since a larger "equivalent" won't do the job.

Remove R18 (30K, 2%) and replace it with a series combination of 51K and 6.8K (the total value required is 58K). If you use 5% resistors you may have to change the 6.8K to get the exact resistance needed; you will determine if this is necessary when you come to the TESTING section.

The output is rated at 50 MA when converted to -12V, NOT the original 200 MA. This is plenty for the TNC's. The derating is necessary to keep the peak current in TR4 and L4 the same as in the -5V circuit at 200 MA.

REDUCTION OF INPUT VOLTAGE (OPTIONAL)

**** Skip this section if you will use more than 15 V input ****

This modification changes two resistors, so that TR2 and TR4 will receive the same amount of base current at 12 V input that the original values provided at 18 V input. This is insurance against getting a board with low gain transistors; the change is recommended even if the board seems to work without it. When this change is made, the recommended voltage from D1 "+" to D1 "-" is 10 to 16 VDC. Replace R7 (240 ohm, 1 Watt) with 120 ohm, 1 Watt. Replace R19 (910 ohm) with 470 ohm.

BYPASS INPUT RECTIFIER (OPTIONAL)

**** NOT for switching supplies which will have AC input ****

The input rectifier bridge has a voltage drop of about 1.5 volts. This needlessly reduces the supply efficiency when only DC input is used, and also increases the required DC input voltage. Connect a jumper from the "+" terminal of

D1 to the terminal of D1 that connects to L2. Likewise, connect a jumper from the "-" terminal of D1 to the fourth terminal of D1, which connects to L1. Be sure the jumper wires cannot short to anything else. Check the continuity from the input leads (with SW1 on, and no power applied): red wire to D1 "+", and white wire to D1 "-". This modification retains the input RFI filter and on/off switch, and also uses D1 as a reversed-input clamp diode. Be sure to use a fuse in the input lead; 1 1/2 amp normal blow should be suitable. The supply draws about 1/2 amp producing 5.1 W output with 13.5 volt input.

**** THIS IS THE END OF THE POWER SUPPLY MODIFICATION ****

Users of TAPR TNC's should continue with the following sections, which deals with some pitfalls peculiar to that device. VADCG and other users should simply disconnect their old supplies and hook up the switching supply; then rejoin this procedure at the TESTING section.

TAPR BOARD CLOCK CIRCUIT

**** ALL TAPR USERS be sure your board is up to date ****

The clock oscillator on older TAPR TNC's would sometimes work at a parasitic frequency (not the one stamped on the crystal). The different rise-time of switching supply (compared to the original linear regulator) can make the problem appear in TNC's that were previously "clean". If the TAPR logon message is gibberish after installing the switching supply, your clock is malfunctioning!

The most recent TAPR kits have modifications in the oscillator to prevent the parasitic mode. If you have a 7404

at U1, you have the new board. If not, replace U1 (7414) with a 7404. Connect a 4.7 K resistor from pin 5 of U1 to pin 3 of U3 (for a neater installation, tie the U3 end to a free pad in the wire-wrap area and run a wire to U3 -- the resistor leads are much less likely to short out other pins that way). Resistors R12 and R13 should be 1.0 K; some early models have 1.5K.

The latest layout has also deleted CY (20 PF from pin 13 of U1 to ground), and added a 470 ohm resistor between C12 and the reset switches. We did not make these modifications, but you may wish to do so if you want an exact duplicate of the latest TAPR boards' circuit.

TESTING

**** For all applications ****

For initial testing, use dummy load resistors instead of your TNC board (in case something is wrong!).

RECOMMENDED TEST LOADS

OUTPUT	VADCG	TAPR	MINIMUM LOAD
+5V	6.8, 5W	6.2, 5W	51, 1/2W
+12V	62, 3W	180, 1W	470, 1/2W
-12V	470, 1/2W	470, 1/2W	1K, 1/4W

If you don't have the recommended load resistors, substitute higher resistance values (up to "minimum load"). Please note that the switching supply's outputs should NOT be tested without any load at all; some current must flow in L3 and L4 so that the semiconductors operate in their normal

modes. POOR PERFORMANCE UNDER NO LOAD CONDITIONS IS NORMAL IN SWITCHING REGULATORS!

Connnect the input wires to a 12 volt source (or 18V, if the reduced input step wasn't performed). Watch the polarity if you have modified for DC input: RED is "+". Don't forget the fuse! Turn on SW1, and measure the +5V output. Adjust RV1 to set it to 5.0 volts. Now check +12 volts; it should be between 11.5 and 12.5 volts (there is no +12 adjustment). Check the -12 volt output; it should be between -11.5 and -12.5 volts. If it is necessary increase the -12V, increase the 6.8K (part of R18); likewise to lower the output decrease the 6.8K. The output changes by .25 V for every 1K change in resistance.

If you have an oscilloscope, you can check the output ripple. It is typically 10 to 20 millivolts peak to peak, at a frequency of 100KHZ. NOTE: poor grounding of the scope will cause noise pickup from the switching transistors, and give a false reading. When the probe tip is touched to the probe's ground lead clip, anything but a flat trace indicates you are picking up noise, not just output ripple.

HOOK IT UP!

**** FOR ALL APPLICATIONS ****

**** TAPR BOARD USERS: SEE DETAILED PROCEDURE IN NEXT SECTION ****

The output of the switching supply should be connected to the board with wire no smaller than #24 AWG, using leads of the shortest practical length. If you choose to install connectors in the leads, be sure they are polarized so you CAN'T POSSIBLY hook it up wrong. If you don't want to use connectors, you can remove the pins at the switching supply output and solder the wires directly to the PC board. VADCG TNC's use the regular power supply connections. DOUBLE CHECK

YOUR WIRING BEFORE YOU TURN ON THE POWER.

TAPR INTERNAL POWER SUPPLY HOOKUP
**** TAPR BOARD USERS only ****

Feeding power to the output of integrated three-terminal regulators can cause them to fail [see "Ciarcia's Circuit Cellar" in BYTE, Jan. 1985]. To prevent this from happening, the regulators will be removed from the TAPR board, and the transformer connected to the switching supply. With this modification in place, the TAPR board can run on either 115 VAC or 12 VDC. YOU SHOULD HAVE FOLLOWED ALL OPTIONS UP TO THIS POINT.

Remove the +5 , +12, and -12 regulators (U24, U22, and U23) from the TAPR board. U24 may have been mounted on your cabinet back-panel. Remove D9 and D12 from the TAPR board. Connect an insulated jumper wire (#24 AWG or larger) from the ANODE side of D9 (not banded) to the output of U22 (pin 3). Connect another insulated jumper wire from the cathode of D12 (banded) to the output of U22 (pin 3). These jumpers bypass the 12 V rectifiers and regulators, so the +/- 12 supply can be connected at J4.

Disconnect the three wires from terminals 3, 4, and 5 of the power transformer. Now examine power connector J4. If you had the +5 regulator mounted outboard there will be a wire at pin 7 (closest to C1). If you don't have a wire there, prepare one (using one of the extra pins supplied with the TAPR kit), and install it at pin 7. Connect the wire from pin 7 to the switching supply +5 output. The wire at pin 6 used to go to the transformer. Hook this one to the +12 output of the switching supply. The wire at pin 5 also went to the transformer; hook it to the -12 output of the switching supply. Finally, hook the wire from pin 4 to the output ground of the switching supply.

If you had the +5 regulator mounted outboard, remove pin 3 from J4 by pressing down the locking barb with a small screwdriver and pulling out the wire. Then salvage the pin by removing the old wire. Connect the RED (positive) input lead of the switching supply and the cathode (banded end) of a 1N4001 diode to the pin (or the last spare pin, if the regulator was mounted on-board). Put the pin back into pin 3 position of J4. Slide a piece of spaghetti tubing or heat-shrink tube over a piece of wire, and solder one end of the wire to the anode end of the diode. Slide the tubing over the diode for insulation. The diode isolates the DC supply from the transformer, so the transformer won't put current out of the DC input leads. Connect the other end of the wire to one side of a fuseholder (for the +12V fuse). Connect the

other end of the fuseholder to a wire (which will be the positive DC input lead). The white lead from the switching supply is the negative DC input lead; splice on additional wire if necessary. The input leads should be run to the +12 supply in a workmanlike and secure way (chassis connector, strain relief, etc.: take your pick).

Check with a VOM to be sure the wiring is correct (from switching supply outputs to the power traces in the wire wrap area). Check for shorts from +12 input to ground (resistance is normal...a SHORT is not). Check continuity for +12 input and ground, from input leads to the switching regulator card.

**** NOTE ****

The TAPR transformer is less than optimum for this application, but it will work at normal line voltage. For low voltage ("brownout") conditions the transformer may be replaced by a 12.6VAC, 1A transformer, or a lower primary tap selected on the TAPR transformer. If you do use higher transformer voltage, remove C1 (2200UF, 16V). It will be operating too close to its maximum rating, and the switching supply has its own fllters. If a battery is connected to the 12V input for backup, the transformer SHOULD BE CHANGED, or else the battery will be loaded constantly (the transformer / rectifier output has to exceed the battery voltage to prevent this).

MOUNTING

**** For all applications ****

The switching power supply may be mounted with #6 hardware, using a set at the holes near each corner. When mounting in a TNC cabinet, keep it as far away as possible from the critical analog circuitry of the modem.

The mounting hardware also serves to ground the the power supply board. In particular, the mounting hole closest to IC3 may be grounded through the mounting hardware to minimize noise on the +12V.

The mounting hole near SW1 MUST HAVE INSULATING HARDWARE to avoid shorting the power input leads to ground. Use either a plastic washer on BOTH top and bottom, or use non-conductive mounting hardware (ie, nylon screw and standoff). Don't rely on the green soldermask film; it is thin and not intended to be used for insulation.

READY TO GO!

Turn on the TNC (by powering up the switching supply). The logon message (or autobaud routine message) should appear. Measure the +5V on the TNC board, and make a small adjustment to RV1 if the voltage is off. If you are using a TAPR board with provisions for both AC and DC power, be sure it works both on 115VAC and 12VDC.

If you have any further results, we welcome them. They may be sent to us by mail, via the RMPRA bulletin Board (N0BRZ-1), or via N0CCZ on DRNET.

Good luck and 73,
--Don Brown, N0BRZ
--Tim Groat, KR0U
--Linc Haymaker, K0ZCO
(Rocky Mountain Packet Radio Assoc.)

From 444953960196489761
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9181142233da02f3,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-25 09:18:16 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site hplabs.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!lll-crg!dual!hplabs!paull
From: paull@hplabs.UUCP (Rob WE6B)
Newsgroups: net.ham-radio.packet
Subject: new packet station
Message-ID: <2077@hplabs.UUCP>
Date: Thu, 25-Jul-85 12:18:16 EDT
Article-I.D.: hplabs.2077
Posted: Thu Jul 25 12:18:16 1985
Date-Received: Sun, 28-Jul-85 07:49:46 EDT
Distribution: net
Organization: Hewlett Packard Labs, Palo Alto CA
Lines: 18

WE6B>ALL:

Yesterday I had my first packet QSO. I logged into W6IXU mailbox system via several repeaters. Later that day I connected with a local station

with a living operator. I found it interesting and exciting. Now I'm thirsting for information on the current amateur digital network structure and how to use it. I would welcome any info operating tips, etc.

My current packet station consists of a Heath HD-4040 TCN, a C-64 used as a 'terminal', and a Yeasu 726R transceiver. What are you out there using?

Well, I'll keep this short for now until I find out if theres anyone listening.

73 DE WE6B +ROB+ IN CAMPBELL,CA. SK
***DISCONNECTED

From -263557555783405078
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,2e99f85ed34b52c7,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-31 12:55:56 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site timeinc.UUCP
Path: utzoo!decvax!decwrl!greipa!pesnta!phri!timeinc!dwight
From: dwight@timeinc.UUCP (Dwight Ernest)
Newsgroups: net.ham-radio.packet
Subject: Networking Notes from N5EG (TEXNET) (1 of 4)
Message-ID: <369@timeinc.UUCP>
Date: Wed, 31-Jul-85 15:55:56 EDT
Article-I.D.: timeinc.369
Posted: Wed Jul 31 15:55:56 1985
Date-Received: Sat, 3-Aug-85 02:40:09 EDT
Reply-To: dwight@timeinc.UUCP (Dwight Ernest)
Distribution: na
Organization: Time, Inc. - New York
Lines: 140

[Note: This series of articles was found on Compuserve and downloaded from HAMNET there on 21 July 1985 by Dwight Ernest KA2CNN 70210,523.]

An Introduction to networks

by T.C. McDermott, N5EG
networks SIG, TPRS

[part 1]

This article is an introduction to the subject of a packet network. It describes what a network is, why a network is necessary to support amateur packet radio activity, and considerations that govern how a network may be constructed. There are many ways that a network can be designed, and it is beyond the scope of this article to elucidate them all. Rather, this article will focus on the simplifing assumptions that may be made in describing a network, and more specifically will concentrate on some suggestions for the Texas Packet Radio Society network which is called "TEXNET".

Most of us are familiar with packet radio activity through our operations with the TAPR TNC board. This board implements what is called a "Local Area Network", or LAN for short. When we wish to communicate, we ask our TNC to CONNECT to another station. If that station is not within range of our transmitter, then we may connect to that station through a digi-peater, or through several digipeaters. This is a convienent extension of the X.25 protocol, and forms a large part of the difference between X.25 and the amateur version called AX.25.

It would be possible to construct a network of stations that are all within range of the next station, and then to connect to any station in the network using this digipeat method, up to 8 stations distant. This would not require the extension of any of the TAPR software, nor would it require the development of any new hardware. Why then is this not an acceptable method to construct a network? Basically this method, although simple to implement has a serious flaw, it lacks "robustness". That is, the method fails to support adequate communications in the presence of a radio path that is not perfect. Secondly, it assures communications integrity through a method known as "end- to-end ACK".

To understand this, it is necessary to understand how a TAPR digipeater works. The TAPR digipeater is a "dumb" digipeater. That is - the digipeater does not understand anything about the state of the two stations that are trying to communicate to each other through it. When one station wishes to connect to another station through a digipeater, it simply adds the digipeater's address in series with the address field of each and every packet. When the digipeater recognizes it's callsign, it repeats the packet. The digipeater does not know what kind of packet is being digipeated, and does not really care. The packet could be a call-request packet, or user-data, or an acknowledge packet, it really doesn't matter, it digipeats them all, blindly. Why is this important? Because it affects how the transmission and acknowledgment of data is handled between the two end stations trying to communicate with each other.

When the sender, S, tries to send data to the receiver, R, through one or more intervening digipeaters, D1, D2, ... , Dn, it does this as follows:

S : sends a packet
D1: digipeats packet
D2: digipeats packet
R : receives packet,
R : sends acknowledge back
D2: digipeats acknowledge
D1: digipeats acknowledge
S : receives acknowledge,
S : sends next packet.

Although there can be several packets sent per acknowledge, it requires that a packet, and the acknowledge (ACK) make the round-trip

from the sender to the receiver. Thus, the more digipeaters, the longer the round-trip time, and the lower the packet throughput.

The above example assumed that there were no errors in the transmission. What happens if one of the packets and one of the acknowldeges is corrupted during transmission?

```
S : sends packet
D1: digipeats packet
D2: doesn't hear packet from D1, so doesn't do anything
S : still waiting for ACK from the receiver
S : still waiting for ACK from the receiver
S : still waiting for ACK from the receiver
S : still waiting for ACK from the receiver
S : still waiting for ACK from the receiver
S : times out waiting for ACK, and re-transmits packet
D1: digipeats the packet
D2: digipeats the packet
R : receives the packet,
R : sends ACK back to sender
D2: digipeats the ACK
D1: doesn't hear packet from D2, so doesn't do anything
S : still waiting for ACK from the receiver
S : times out waiting for ACK, and re-transmits packet
D1: digipeats the packet
D2: digipeats the packet
R : receives the packet, but it's a duplicate - throw away
R : sends ACK back to sender
D2: digipeats the ACK
D1: digipeats the ACK
S : receives the ACK,
S : sends the next packet
```

How long did this take? About 25 packet times. The situation gets worse when 8 digipeaters are chained together. In fact with 8 digipeaters the round-trip time reduces the channel throughput by a factor of approximately 16 (8 hops to R, and 8 hops for the acknowledge to come back) if there are no channel errors. If the probability that any single transmission is corrupted is about 70 percent, then with 8 hops the average round trip will take about 1000 packet times. In other words, nothing will get through.

Why is the TAPR TNC built this way you might ask? For a very good reason - simplicity. To build a digipeater that behaves in a more coordinated fashion turns out to be a very complicated problem. The TAPR digipeater extension is far superior to the other alternative - no digipeater at all. The TAPR digipeater is elegantly simple, and a reliable way to improve the communications between two stations that are reasonably close, but not able to communicate directly. We have seen that one or two digipeaters may not degrade the throughput terribly, provided that the RF paths are highly reliable. Thus the digipeater solution may be called an LAN solution. That is, it is an acceptable network for small numbers of digipeaters, and high-quality circuits. A

single digipeater in a superior location allows many stations within the coverage area of the digipeater to communicate. But the digipeater is not an acceptable solution when the need is to communicate over long distances, and with less than high-quality communications circuits.

     Thus is born the requirement for a NETWORK. This will be discussed in the next article of this series.

--

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"The opinions expressed above are those of the writer and do not necessarily
 reflect the opinions of Time Incorporated."

From 7743713599745710919
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,7c1f53e25826c68c,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-31 12:57:02 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site timeinc.UUCP
Path: utzoo!decvax!decwrl!greipa!pesnta!phri!timeinc!dwight
From: dwight@timeinc.UUCP (Dwight Ernest)
Newsgroups: net.ham-radio.packet
Subject: Networking Notes from N5EG (TEXNET) (2 of 4)
Message-ID: <370@timeinc.UUCP>
Date: Wed, 31-Jul-85 15:57:02 EDT
Article-I.D.: timeinc.370
Posted: Wed Jul 31 15:57:02 1985
Date-Received: Sat, 3-Aug-85 02:40:58 EDT
Reply-To: dwight@timeinc.UUCP (Dwight Ernest)
Distribution: na
Organization: Time, Inc. - New York
Lines: 135

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An Introduction to Networks
part 2

by T.C. McDermott, N5EG
networks SIG, TPRS

     In the last article the distinction between a LAN and long- haul network was made. Also the performance problems associated with unreliable radio circuits and the End-to-end ACK was discussed. This article will present some other methods of information transfer possible.

Another method of information transfer possible is "HOP-TO- HOP" acknowledge. In this method, each packet, or small group of packets, is acknowledged by every receiving station along the path from the sender to the receiver. For example, using the same terminology as the last article, S=sender, R=receiver, D1,D2, ... Dn = digipeaters.

```
S  : send packet
D1 : ACK to S, repeat frame
D2 : ACK to D1, repeat frame
R  : ACK to D2.
```

Why does this method improve the throughput of the system ? Because now that the sender, S does not have to wait for the ACK to return from R, S may send another packet after the ACK from D1. That is, it may OVERLAP traffic.

```
S  : send packet 1
D1 : ACK S-1, repeat 1
D2 : ACK D1-1, repeat 1       S  : send packet 2
R  : ACK D2-1                 D1 : ACK S-2, repeat 2
                              D2 : ACK D1-2, repeat 2
                              R  : ACK D2-2
```

In other words, once that S has received it's acknowledge, it may transmit the next packet almost immediately (if D1 is on the same channel, it should wait for the D2 --> D1 ack first, if the D2 --> D1 link is on a different frequency [as in a network] then S could transmit the next packet immediately upon receiving the D1 ACK). What happens to the flow of information in the presence of errors in the transmission ? Lets look at an example:

```
S  : send packet
D1 : ACK S, repeat packet
D2 : gets garbled packet from D1
D1 : waiting for ACK from D2
D1 : retransmits packet to D2 after time-out
D2 : ACK D1, repeat packet
R  : ACK D2
```

In article one, with this same exact scenaro, it took 25 packet times to accomplish the transfer of one packet from S to R through 2 digipeaters. In this example it took 6 packet times, a 417 % performance improvement in the transmission time. This performance improvement actually increases with more digipeaters, or worse RF paths. In fact with 8 digipeaters, and a 70 % probability of a sucessful packet-hop, this approach offers about a 10,000 % performance advantage !

Additional to the transit time advantage (time delay per packet in seconds-from-S-to-R), there is the advantage in throughput (bytes/sec.). The throughput in the HOP-TO-HOP ack method is NOT dependent upon the number of digipeaters. This is because as soon as the first digipeater

has acknowledged the reception of the senders' packet, the sender is free to send the next packet, regardless of the number of hops in the path. Contrast this to the end-to-end hop method, where the throughput is very dramatically dependent upon the number of hops in the path.

What is required of the digipeaters in the network to handle this type of repeating function, i.e. HOP-TO-HOP digipeating? Each repeating station is required to contain a fair amount of memory, enough to buffer every packet that it digipeats until that packet is acknowledged by the next repeater. Since the repeater may receive packets from several different stations at nearly the same time, and perhaps some of them are occaisonally garbled in transmission to the next repeater, then they must be stored in repeater memory until they are sucessfully passed to the next repeater.

The repeaters must also implement some sort of flow control. If packets arrive faster than they can be sent, then the buffer memory could overflow. Thus the repeater must be able to tell the previous repeater, or sender, that the packet is rejected, and to stop sending. When the repeater clears the messages, and thus frees up some memory, then it re-initiates packet transfer from the previous station. This finite memory size limitation actually causes the end-to-end performance of the network to become more heavily dependent upon the quality of the RF links. Thus performance of the HOP-TO-HOP system is dependent upon the probability of RF path-hop success, but is not heavily dependent upon the number of repeaters in the path, unlike the END-TO-END scheme. This was taken into account when I stated that the performance of the HOP-TO-HOP ack with 8 digipeaters, and 70% path-hop probability of success was about 10000% better than the END-TO-END method.

There is one intetersting dis-advantage to the HOP-TO-HOP scheme, although it is not a strong disadvantage, and that is the issue of data integrity. In the END-TO-END ack (EEA) scheme when the receiver acquired the data, the ACK was sent. Thus when the sender receives the ACK, there is certainty that the data was in fact received. In the HOP-TO-HOP ack (HHA) all that is known when the sender receives the ack, is that the first digipeater received the ack. A failure in the network could still block the receiver from receiving the data - thus the sender was ACK'ed even though the receiver had not received the data. This is not as serious a problem as it sounds at first, however, since there is still a method to determine whether the data is received at the final destination correctly.

This is handled by layer 4 of the OSI model - the transport layer. It is responsible for data integrity in the real world of unreliable networks. One protocol for doing this is familiar to those of us with AX.25 units, and this is the Virtual Circuit protocol. Each of us is intimately familiar with virtual circuits. Any time that you connect to another station, you have generated a virtual circuit. You and the receiver communicate on a common channel with everybody else. But your traffic only goes to your desired destination, not all destinations on the channel. Thus there is a circuit between you and the connected receiver on a channel with a (theoretically) unlimited number of

circuits. This is called a virtual circuit. The only reason there is a circuit is because you and the connected receiver previously agreed to a connection. The circuit is dissolved when you and the receiver agree to this (disconnect). The next article in this series will deal with the virtual circuit protocol on the network, as opposed to the virtual circuit between the sender and the network, or between the receiver and the network, which is something different.
--

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X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-31 12:57:58 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site timeinc.UUCP
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Article-I.D.: timeinc.371
Posted: Wed Jul 31 15:57:58 1985
Date-Received: Sat, 3-Aug-85 02:41:39 EDT
Reply-To: dwight@timeinc.UUCP (Dwight Ernest)
Distribution: na
Organization: Time, Inc. - New York
Lines: 192

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An Introduction to Networks
part 3

by T.C. McDermott, N5EG
networks SIG, TPRS

     The last article discussed End-to-end Vs. Hop-to-hop methods of acknowledge, and the attendant advantages of each. As you may recall, one of the disadvantages of the HHA was the possibility of a network failure still allowing the sender to have been acked for data that may not, in fact, have been received.

Generally, this is not a problem. If communications fails along a path we naturally tend to want a re-transmission of the entire contents of whatever file we may have been sending. If we happened to be in the keyboard mode, then since the communications fialed, we cannot continue to send anyway. Thridly, our TNC's do not tell us how much data they have in their transmit buffers that has not been acknowledged, so the HHA network really doesn't differ from the types of responses that we are used to from the TNC - LAN system.

If we must guarantee the absolute integrity of a file transfer, then we should implement some type of block numbering and sequencing program that controls the file transfer process. In essence, something like the MODEM7 protocol tacked on top of our existing TNC protocol would guarantee the complete integrity of files transfered. We would probably want to add onto the MODEM7 system a little bit, perhaps to record what was and was not sucessfully transfered, and perhaps a method of automatically re-establishing the connection to the other station, and continuing with the transfer process until it is sucessfully completed, and then tearing down the connection.

This additional program that we would run on each of our end-user computers (both sender and receiver) is the LAYER 4 of the OSI model - the transport layer. Since the network we are talking about constructing is thus releived of absolute ACK integrity by the presence of this additional program (in those rare instances where it is really needed) then our netork is only restricted to providing a reasonable guarantee of integrity, perhaps guaranteeing that packets arrive in the correct sequence, and without bit errors. Thus with an emphasis on the HHA VS. the EEA methods, we have decided to build a network that optimizes throughput and response, allowing for a layer 4 program in the event it is needed, but not sacrificing the performance of the network for the vast majority of the uses of the network. This trade-off is usually described as a speed-integrity tradeoff in the literature.

Now that a decision has been reached on the desired attributes of the network, that is speed, and simplicity, we may concentrate on one final interface aspect, and that is how the LAN (i.e. the TAPR TNC's) are to interface and establish connection through the network. This linkage is the peer communication between two layer 3 processes that is described by Tannenbaum [1].

In the 7-layer OSI model, subnet communication (that is communication through a network) is established between two layer 3 processes - that is, the TAPR TNC AX.25 mode, and the network entrance and exit layers. Although AX.25 is sometimes discussed as a layer 2 protocol, in the LAN application it is really a layer 3 process. It establishes, communicates, and terminates, and thus it is a layer 3 process. Similarly the network, upon command, will establish, communicate, and terminate, thus it also is performing a layer 3 function.

Why the concern about which layers to call each other? Because it is desirable that the TNC's be able to use the network without any

modification. Thus the network must be compatible to the way that the TNC establishes, maintains, and terminates connections, since the network must establish, maintain, and terminate connections to or from TNC's and itself. We are faced with the choices as to how the TNC and the network can talk with one another.

One method of network interface is to assume that the network is transparent, that is it looks like a digipeater. Then you would use your TNC as though the network were a single digipeater (even though it might have many hops, it would appear to the TNC as one digipeater).

Another method is to treat the network as a spearate LAN address. This is, you would connect to the network. Then the network would engage in an interactive session with you regarding the type of service that you needed, that is, who you wanted to talk to, and how to get through the network to that place. Once the network computer was satisfied, it would then engage in comunications between the endpoints. Your TNC would think it was connected to the network, not to your actual destination station.

Each of these connection methods has advantages and disadvantages. We will discuss some of them here.

The digipeater-emulation method is a very natural method to use, because the connection method is familiar to all of the TNC users. Let us establish the following scenario: WD0ETZ in Carrollton wishes to communicate with WD5GAZ in Houston. WD0ETZ knows that this distance will require the use of the network. So WD0ETZ proceeds as follows...

Connect WD5GAZ VIA DALLAS

This seems simple enough, but some interesting problems crop up almost immediately. How does the network know where to find WD5GAZ? What path is required to get there? WD0ETZ's TNC is going to want to see ACK's from WD5GAZ, not from DALLAS.

First problems first. One way for the network to know how to find WD5GAZ is for it to keep tables in all of the sites of each and every network user. This is really not practical in an amateur environment because hams move, come, and go, and even change callsigns, and with very many users, it takes a lot of manual intervention to keep the tables current. It also takes a lot of computer power in the network to store and route messages based upon these tables. In the event of a network crash, the tables would have to be reloaded, etc. A simpler way would be for the originator, in this case WD0ETZ, to specify the network "hop-off" point, that is, the location in the network where WD5GAZ is likely to be found. For example:

Connect WD5GAZ VIA DALLAS,HOUSTON

Now the network knows that the entry point is this network (which is "DALLAS", the one hearing WD0ETZ) and the exit point is HOUSTON. Perhaps different types of names would be chosen for network nodes.

Grid-squares and major city names seem to be two obvious choices. What about the route to take to get along the network? There is an incomplete but simple answer to this question - make a linear network (or a simple variant of linear). A linear network is one where the network is basically a straight line. Thus there is by definition only one path between any two points. A few other questions. What if WD5GAZ is not within range of the HOUSTON node, but perhaps within range of a station that is near to the node - for example suppose that WA5AAA is between the HOUSTON node and WD5GAZ. Then...

Connect WD5GAZ VIA DALLAS,HOUSTON,WA5AAA

What if WD0ETZ is not within range of the DALLAS node, but is within range of WB5QNG, who is within range of DALLAS ?

Connect WD5GAZ VIA WB5QNG,DALLAS,HOUSTON,WA5AAA

Well, the addressing would work. But the network entry point has to do some strange things to the address field. Remember in the HHA scheme it would be the address DALLAS that is actually ACKing WD0ETZ, and not WD5GAZ that would be ACKing WD0ETZ, so the network node has to play "fast-and-loose" with the address headers in the digipeat field.

The other method is fairly straight forward. The user connects to the network, and then enters an interactive Q & A session:

```
Connect DALLAS
Welcome to TEXNET - DALLAS node.
There are currently 4 other users connected to DALLAS.
Enter destination callsign ? ( WD5GAZ would be entered here)
Enter network exit node    ? ( HOUSTON would be entered)
Enter destination digipeaters ? (WA5AAA would be entered)
CONNECTION ESTABLISHED - PROCEED
```

Notice one thing in the above scenario: more than one station may be connected to the network node entry and exit points. This is something that is a little foreign to the AX.25 protocol, that is MULTIPLE VIRTUAL CHANNELS to a single TNC. In this case it is still compatible with AX.25 since both source and destinations callsigns are part of the AX.25 standard. Only the network nodes have to have this special property of having to be connected to several different stations simultaneously - thus the AX.25 code for these controllers is a little different from a normal implementation. But only the network requires these special TNC's (actually they are built into the node controller, and aren't identifable as a separate device).

The reason that the network should allow for multiple virtual channels is to allow multiple people to simultaneously use the network. Since we will put high-speed radios in the network between nodes, we should take advantage of the bandwidth available.

At this point we will not go into the network protocol required to implement these connection schemes, that "play-games" with the address

header fields to keep our TNC's happy, and that perform the HHA transfer between the network nodes, do flow control inside the network, and route the signal to the destination. That is the subject of another article.

     The next article will deal with the type of hardware that will be required to support this concept of a network, and it turns out to be surprisingly modest. There are some other concerns about capacity, response time, channel utilization, reliability, and remote network "resuscitation" (in the event of software failure) that will also be addressed in part 4 of this series.
--

          --Dwight Ernest   KA2CNN   \ Usenet:...vax135!timeinc!dwight
            Time Inc. Edit./Prod. Tech. Grp., New York City
            Voice: (212) 554-5061 \ Compuserve: 70210,523
            Telemail: DERNEST/TIMECOMDIV/TIMEINC \ MCI: DERNEST

"The opinions expressed above are those of the writer and do not necessarily
 reflect the opinions of Time Incorporated."

From 6862193083305784602
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,384a62a84a49b2c3
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 150311,d55785c17a1a7dca
X-Google-Attributes: gid150311,public
X-Google-ArrivalTime: 1985-11-03 18:38:33 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site yojna1.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!seismo!umcp-cs!aplcen!cp1!yojna1!wb6rqn
From: wb6rqn@yojna1.UUCP (Brian Lloyd)
Newsgroups: net.micro.6809,net.ham-radio.packet
Subject: Re: Would os-9 and packet be a winning combination?
Message-ID: <114@yojna1.UUCP>
Date: Sun, 3-Nov-85 21:38:33 EST
Article-I.D.: yojna1.114
Posted: Sun Nov 3 21:38:33 1985
Date-Received: Fri, 8-Nov-85 03:58:04 EST
References: <835@lsuc.UUCP> <???@eddie.UUCP> <223@ius2.cs.cmu.edu>
Distribution: net
Organization: Yojna1 Amateur Radio Packet Unix System; Germantown, Md.
Lines: 35
Xref: linus net.micro.6809:558 net.ham-radio.packet:116

> I've read on the net that some people in Hamburg are working on a 'eurocard'
> TNC, and that another company in the US makes a 'eurocard' 6809 system that
> can run OS-9. I've also heard that the TAPR TNC-1 is 6809 based, and
> that a amateur radio operator in the Pittsburgh area is doing packet on
> his Color Computer (another 6809 based machine) by hooking up FSK chips
> to I/O channels.

You have the cart before the horse. The development environment and available

tools should help you decided which processor to use. OS-9 runs on the 6809 and the 68000 (68010, 68020). The tools seem to be reasonable and the OS is real-time and multitasking, certainly points in its favor.

> Why would the 6809 be better than, say a z-80? Would the fact that good
> implementations of multasking OSes (like OS-9) are available for it?
> (This would seem to make software which supports multiple connections
> easier to write.) Or is the Z-80 the preferred processor for packet,
> simply because of cost?

The 6809 is not intrinsicly better than the Z-80, nor is the Z-80 better than the 6809. The choice to switch to the Z-80 was driven by the fact that many people already have systems that allow development of software for the Z-80.

All future development will probably occur in 'C' allowing transportability of software. Since this is happening, all you will need is a 'C' compiler on the target machine and you will then have the ability to run the desired software.

Since we need to operate in a multitasking environment for the implementation of networks and servers, it would be nice if we could settle on an operating system. It should be multitask, it should be cheap, it should be generally available, and it should run on a variety of hardware. OS-9 is certainly a candidate since it has been ported to the 68000 family.

73 de Brian, WB6RQN

From 9075508128732084136
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,65082d49611476b3,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-03 21:08:09 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: HF Packet Questions(TAPR)
Message-ID: <307@mit-eddie.UUCP>
Date: Mon, 4-Nov-85 00:08:09 EST
Article-I.D.: mit-eddi.307
Posted: Mon Nov 4 00:08:09 1985
Date-Received: Tue, 5-Nov-85 06:33:14 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 31

From: megatest!cadvax.roman@glacier (Roman Rycerz)
hi i use HF packet.... all seem to use 200hz shift 1600-1800 tones..
and the most popular freq is 14.103 mhz lsb..

also here is a list of PBBS/GATEWAYS

here is the list i have of all the bbs i know about...
-roman
{lbl-csam,decvax!decwrl![sun|amd|fortune]}!megatest!roman

Call qth freq mode tones

w0rli Westford Mass. 14.103 lsb 1600-1800
k7pyk Tuscon Ariz. 14.103 lsb 1600-1800<- Dx
kd6sq Cucamomga Calif 14.103 lsb 1600-1800
ki0q Ames Iowa 14.103 lsb 1600-1800
kf4jf 14.103 lsb 1600-1800
wa4szk Florence S.Carolina 14.103 lsb 1600-1800
w9td Schamburg Ill. 14.103 lsb 1600-1800
n1dl Sudbury Mass. 14.103 lsb 1600-1800<- Dx
kc2tn Atco N.J. 14.103 lsb 1600-1800
ki4xo 14.103 lsb 1600-1800
wb9mjn Naperville Ill. 14.103 lsb 1600-1800
w5xo Gause Tex 14.103 lsb 1600-1800
wb4apr 14.103 lsb 1600-1800
k3pvz 14.103 lsb 1600-1800
k4eid Knoxville Tenn. 14.103 lsb 1600-1800
wb7dch Enumcalaw Wash 14.103 lsb 1600-1800
wb8wga Central Ohio 14.103 lsb 1600-1800
w6cus-1 Richmond Ca 14.103 lsb 1600-1800

From 7696754457208478614
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,da594528c4db1a3e
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-04 13:05:15 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!Sewhuk.HENR@Xerox.ARPA
From: Sewhuk.HENR@Xerox.ARPA
Newsgroups: net.ham-radio.packet
Subject: Re: Q Street on TNCs
Message-ID: <309@mit-eddie.UUCP>
Date: Mon, 4-Nov-85 16:05:15 EST
Article-I.D.: mit-eddi.309
Posted: Mon Nov 4 16:05:15 1985
Date-Received: Tue, 5-Nov-85 07:38:58 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 8

From: Sewhuk.HENR@Xerox.ARPA
Not only that it makes other commercial companies look bad when the TAPR
boys say that other companies TNCs are not compatible!!! They won't
admit they didn't adhere to their own spec. I hope that TAPR, Heath,

AEA and the rest of the TAPR clones are forced to update those buggy
units out there.

73, Dave - N2GH   (...>HALTON>ATTICA>N2GH)

From -5928554488493359408
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,8046de0ab6f34cad,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-04 17:01:37 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site amdimage.UUCP
Path: utzoo!linus!philabs!prls!amdimage!cmoore
From: cmoore@amdimage.UUCP (chris moore)
Newsgroups: net.ham-radio.packet
Subject: Network Protocols
Message-ID: <702@amdimage.UUCP>
Date: Mon, 4-Nov-85 20:01:37 EST
Article-I.D.: amdimage.702
Posted: Mon Nov 4 20:01:37 1985
Date-Received: Fri, 8-Nov-85 06:14:33 EST
Distribution: net
Organization: AMDIMAGE, Sunnyvale, CA
Lines: 26

To start with, let me first say that I really don't know
anything about networking and not much about packet (yet).

After reading the discussions about the various approaches
to handling the network protocol, I have one (probably
naive) question: How will all this affect me?
More specifically, if I go out and buy a TAPR (or similar)
TNC, what do I have to do to be able to connect to
Joe Blow in Anytown, USA. Will I have to be registered
with someone who controls a net? Will he? As I understand
things currently, I have to know which digipeaters I want
to hit to connect to him. Will I still have to know this?

I'm just a little concerned that, know that I have almost
figured out how packet works, I'm going to have to spend the
next 2 years studying network theory to find out how to talk
to someone.

--

Of course we have backup tapes. Do you want last year or the
 year before?

 Chris Moore (408) 749-4692
 UUCP: {ucbvax,decwrl,ihnp4,allegra}!amdcad!amdimage!cmoore

From -8744185253522014814
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,65082d49611476b3
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-05 06:48:30 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site anasazi.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!hao!noao!terak!mot!anasazi!john
From: john@anasazi.UUCP (John Moore)
Newsgroups: net.ham-radio.packet
Subject: Re: HF Packet Questions(TAPR)
Message-ID: <327@anasazi.UUCP>
Date: Tue, 5-Nov-85 09:48:30 EST
Article-I.D.: anasazi.327
Posted: Tue Nov 5 09:48:30 1985
Date-Received: Fri, 8-Nov-85 21:09:17 EST
References: <307@mit-eddie.UUCP>
Reply-To: john@anasazi.UUCP (John Moore)
Organization: Anasazi, Phoenix Az.
Lines: 13

In article <307@mit-eddie.UUCP> KPETERSEN@SIMTEL20.ARPA writes:
>Call   qth   freq   mode tones
>
>k7pyk   Tuscon Ariz.   14.103   lsb 1600-1800<- Dx
...actually in Phoenix Arizona. The K7PYK 2 meter repeater is located
just outside tucson and links Phoenix and Tucson on 147.70/10 (duplex
audio repeater used for packet).
--
John Moore (NJ7E/XE1HDO)
{decvax|ihnp4|hao}!noao!terak!anasazi!john
{hao!noao|decvax|ihnp4|seismo}!terak!anasazi!john
(602) 952-8205 (day or evening)
5302 E. Lafayette Blvd, Phoenix, Az, 85018 (home address)

From 3576356994067305475
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,676316351e269afe,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-05 14:01:15 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!SATISH%upenn.csnet@CSNET-
RELAY.ARPA
From: SATISH%upenn.csnet@CSNET-RELAY.ARPA
Newsgroups: net.ham-radio.packet
Subject: Hi everybody! I am on visit to USA to learn about
Message-ID: <325@mit-eddie.UUCP>
Date: Tue, 5-Nov-85 17:01:15 EST
Article-I.D.: mit-eddi.325
Posted: Tue Nov 5 17:01:15 1985

Date-Received: Fri, 8-Nov-85 06:57:30 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 15

From: Satish Joshi <Satish%upenn.csnet@CSNET-RELAY.ARPA>
Networks (from Tata Inst of Funda Research, Bombay, India).
Currently I am doing a survey of networks in operation including PRNETs
& hope to publish it.
I would welcome any & all kind of info. on PRNETs from you.
I am interested in obtaining info. about the network config.,
traffic volume, history of N/W, future directions of the networks
in operation.
If you can send titles of relevant papers (or a copy), details of
network if you are associated with one, I will appreciate it very
much.
In the long run, we are planning to build a PRNET in India, for
telegraphy as it seems to be the appropriate technology for us.

Thanks in advance.

From -7440754435628084885
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f3f8f9b715627c54
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-05 16:13:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!linus!decvax!bellcore!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Re: General questions on packet
Message-ID: <672@petrus.UUCP>
Date: Tue, 5-Nov-85 19:13:00 EST
Article-I.D.: petrus.672
Posted: Tue Nov 5 19:13:00 1985
Date-Received: Fri, 8-Nov-85 06:48:43 EST
References: <1260@sphinx.UChicago.UUCP> <667@petrus.UUCP>
Organization: Bell Communications Research, Inc
Lines: 8

> > 1) Where can I get lots of information about it? The only
> >   documentation I have so far is the November CQ magazine.

Oops, almost forgot. The May 1985 issue of the IEEE Journal on Selected
Areas in Communications carries the article "Packet Radio in the Amateur
Service", by Harold Price, Bob Diersing, and yours truly.

Phil

From 3603162907799041989

X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5e279e882a0feef6,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-06 07:19:57 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site inuxi.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!inuxc!inuxi!wheatley
From: wheatley@inuxi.UUCP (Steven Wheatley)
Newsgroups: net.ham-radio.packet
Subject: TAPR TNC-2 (rev. 2) info
Message-ID: <261@inuxi.UUCP>
Date: Wed, 6-Nov-85 10:19:57 EST
Article-I.D.: inuxi.261
Posted: Wed Nov 6 10:19:57 1985
Date-Received: Thu, 7-Nov-85 06:12:07 EST
Distribution: net
Organization: AT&T Consumer Products, Indianapolis
Lines: 25

Called the TAPR hot line this morning and received the following info:

they have shipped boards into the low 1100's (1104 on monday eve).
Hope to ship all remaining orders (up to 1200) this week. They will
NOT be selling further boards....GLB will be selling the kits.

FIXES (rev 2 boards)

A test on page 44 of the assembly manual:

> the STA light will fail to go out. PLEASE install IC U-24 (the
> second 8 K ram, 6264).

front panels will be missing from all kits with rev 2 boards, will
be shipped this week.

the board shipped is rev 2, the assembly manual erroneously makes
reference to rev. 3.

steve, ku9c (anxiously awaiting UPS)

From 788834844376087686
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6d09cd6a7b5a983b,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-06 11:28:53 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP

Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: The League Responds
Message-ID: <677@petrus.UUCP>
Date: Wed, 6-Nov-85 14:28:53 EST
Article-I.D.: petrus.677
Posted: Wed Nov 6 14:28:53 1985
Date-Received: Fri, 8-Nov-85 07:58:53 EST
Organization: Bell Communications Research, Inc
Lines: 30

M 11273 JEFF WARD (ARRL,2977) 11/ 6/85   9:49 AM L:27
KEYS:/REVIEW/DEFENDING MYSELF/
A: 10068   TO: NK6K, ka9q, WA7GXD, ARRL

RE: Message from K1BC

The review of the TNCs that was in November QST was turned in
in March of this year. Therefore, it does not reflect developments
from this summer or even those of late spring.

At the time that the review was written, we (Jon Bloom and I) did
not know the exact nature of the TAPR protocol problems. Even now,
when these problems are completely understood, they could hardly
be described to someone in a the context of a product review. As for
the fact that TNC1 does not support AX.25V2, there were no TNCs
(at that time) that did support the updated protocol. I agree,
though, that this should have been mentioned.

"ARRL continues to write only glowing reviews." I wrote the
review, and the notes on the Heath TNC were filled in by Mark
Wilson, AA2Z. We liked the TNCs, they worked well, they were
by far the best on the market. The design and manufacture of
the TAPR TNC was a milestone in Amateur Radio, a feat of creativity
and perserverance. We wanted to end up with a glowing review.

The fix for NOVRAM scrambling that AEA used is, I think, the same
one that was written up in an issue of PSR this year. I can't
find the exact issue, but someone will remember.

Jeff

From -6351435772726622590
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,2d6f9142fa1128ee,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-06 18:34:42 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!
BRUCE%UWALOCKE.BITNET@WISCVM.ARPA

From: BRUCE%UWALOCKE.BITNET@WISCVM.ARPA
Newsgroups: net.ham-radio.packet
Subject: More Kantronix dialog
Message-ID: <332@mit-eddie.UUCP>
Date: Wed, 6-Nov-85 21:34:42 EST
Article-I.D.: mit-eddi.332
Posted: Wed Nov 6 21:34:42 1985
Date-Received: Fri, 8-Nov-85 21:22:28 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 11

From: BRUCE%UWALOCKE.BITNET@WISCVM.ARPA
Regarding John Moore's question;
Without getting terribly verbose,The "World Chip" is a FSK Modem chip made
by Advanced Micro Devices.It is also known as an Am7910 and meets the specs
for, Bell 103,113,108 CCITT V.23 and V.21 (hence the "world" designation).
It doesn't do Bell 212 protocol. It is a 28 pin chip and the different modes
are pin selectable. It needs + and - 5v.

Bruce A. Edwards N7EHM

BRUCE%UWALOCKE.BITNET

From 7647951469798167577
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,370149571d2b715e,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 122486,847e48a55693a5a2
X-Google-Attributes: gid122486,public
X-Google-ArrivalTime: 1985-11-07 01:33:30 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site rti-sel.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxt!houxm!whuxl!whuxlm!akgua!mcnc!
rti-sel!jb
From: jb@rti-sel.UUCP (Jeff Bartlett)
Newsgroups: net.news.group,net.ham-radio.packet
Subject: Re: Reducing costs to USENET backbone sites, packet radio
Message-ID: <534@rti-sel.UUCP>
Date: Thu, 7-Nov-85 04:33:30 EST
Article-I.D.: rti-sel.534
Posted: Thu Nov 7 04:33:30 1985
Date-Received: Sun, 10-Nov-85 06:35:42 EST
References: <598@aicchi.UUCP> <838@psivax.UUCP>
Distribution: net
Organization: Research Triangle Institute, NC
Lines: 110
Xref: watmath net.news.group:4362 net.ham-radio.packet:115

> In article <598@aicchi.UUCP> dbb@aicchi.UUCP (Burch) writes:
> >Well, what about making the whole mess more efficient?
> >To this end;

> >1. Stargate; This seems like the best way for backbone sites to ship stuff.
> >   It has the advantage of being "free" and allowing the creation of
> >   "erzatz backbones" that have cable and can suck the stuff off CNN for
> >   their own use and for those sites that they feed.
>
>   Sounds nice, but at present Stargate does not allow
> "discussion" groups, only moderated ones, so it is not sufficient
> on its own to provide for the needs of the whole net.
>

It also may cause problems with the single point of control/attack for news
groups such as net.{religion,abortion,origin,motss,..etc}.

> >2. Buy some better modems; .....

> >3. Fix NETNEWS. .....

> >4. Find "interested sites". .....

> 5. Restructure net connectivity to reduce the number and cost of the
>   long distance connections, replacing them with a greater number of
>   moderate to short distance connections.

> 6. Have the recieving sites pay for the news ....

Has anyone else noticed the quiet revolution that is happening in
net.ham-radio.packet?

Devices known as Terminal Node Controllers (TNCs) are used to implement
a packet network, similar to ethernet, using the AX.25 protocol,
300 baud modems, and radio links.

Recently, a journal quality article was published describing the
Wiretap Algorithm a [.. class of routing algorthms that compute quasi-optimal
routes for stations sharing a broadcast channel, but with some stations
hidden ..] .   It described work done in the Washington DC area in connecting
forty-two TNC's and Digi-Repeaters. (see <257@mit-eddie.UUCP>)

    Digi-Repeaters are single board computers with a two or more
    TNC/radios connected that echo packets along.

I seem to remember reading that when the TAPR box (a TNC) was announced
for release that the local telco ESS was jamed for a few days because
of phone orders. Hundreds were sold.

[for new.group]
... Consider Now that the backbone sites were connected with radio-links.

    == A lot of radio equipment can be bought for the amount of money
        spent per year in long-distance calls.

    == You say 300 baud is too slow, install N links in parallel, on
        different frequencies.

(Wiretap describes 1200 baud using VHF)

== Sun-spot activity causes un-reliable operation, revert back to long-distance dial-up temporary.

[for ham-radio.packet]

Recently, it was noted that a NameServer system was needed so that the ham operators could determine the latest path from point A to B. Name-space is not a problem since station ids are assigned by the FCC.

This system could consist of several geographically remote unix machines that answered queries and periodically syncronized.

A requester would query the nearest NameServer for a connection path. It would then use this information for the life of the connection.

All live sites would periodically broadcast a beacon packet that would be overheard by the NameServer. Any bad connections would be reported to the NameServer; for which it could suggest alternate paths. (It could also investigate the reason why: did a station go off-line?)

[both groups]

Lets See... One group needs NameServers and the other needs lower communication costs.

Let ... Some Unix sites become NameServers in exchange for using spare capacity on Digi-Repeaters and TNCs.

In fact, some of sites may find local amateur radio groups willing to loan equipment to them (maybe .. local phone-lines to ham-shacks) so that their members have a NameServer in their area.

A radio linked USENET would:
- not be at the mercy of Ma-Bell.
- be very fault-tolerance.
- be highly connected.
- be able to handle more traffic at almost flat cost.
- etc.......

Let's hear it, what do the two groups have to say?

Ummm.. nameservd

Jeff Bartlett
Research Triangle Institute
Research Triangle Park, NC
mcnc!rti-sel!jb
^^^ "backbone"
^ 56k baud microwave

P.S. Any ham operator in the triangle, please feel free to sent me mail..

From -7707059214726097779
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,b25911c00f4006f7,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-07 07:23:43 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!qantel!hplabs!pesnta!amd!vecpyr!lll-lcc!
lll-crg!seismo!harvard!think!mit-eddie!halbert%pbsvax.DEC@decwrl.DEC.COM
From: halbert%pbsvax.DEC@decwrl.DEC.COM
Newsgroups: net.ham-radio.packet
Subject: What are the bugs in the TAPR TNC code?
Message-ID: <338@mit-eddie.UUCP>
Date: Thu, 7-Nov-85 10:23:43 EST
Article-I.D.: mit-eddi.338
Posted: Thu Nov 7 10:23:43 1985
Date-Received: Mon, 11-Nov-85 06:11:17 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 6

From: halbert%pbsvax.DEC@decwrl.DEC.COM (Dan Halbert HLO 2-3/M08 DTN 225-6305)
Some people have recently mentioned that there are bugs in the TAPR TNC code.
What are the more serious bugs that violate protocol? Are they the product
of bad algorithm design, or are they just "oops"'s?

--Dan, kb1rt

From 6152872347935388286
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,664d1ed1a0dbe3e9,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-07 11:54:14 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!prls!amdimage!amdcad!lll-crg!seismo!harvard!think!mit-
eddie!clements@bbnccq
From: clements@bbnccq
Newsgroups: net.ham-radio.packet
Subject: Wiretap paper, TNC bugs
Message-ID: <342@mit-eddie.UUCP>
Date: Thu, 7-Nov-85 14:54:14 EST
Article-I.D.: mit-eddi.342
Posted: Thu Nov 7 14:54:14 1985
Date-Received: Sun, 10-Nov-85 15:38:10 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 47

From: Bob Clements <clements@bbnccq.ARPA>
Dave,

I finally got around to actually reading your Wiretap paper all the way through. Thanks for posting it. It's a good first real experiment on a subject that lots of us have thought about but never actually done.

Another item for your list of "problems" with the approach would be buggy nodes. These can give you false connectivity info in your tables.

A couple examples:

The GLB TNC (in at least some software versions) decides to digipeat frames that were not addressed to it or through it. A guess is that if it has a number of frames in its processing queue, and it finds one that it should digipeat, it just digipeats the whole list. Exact bug not known, but something like that. So you would hear a frame that appeared to be from a station you might not really be able to hear. The W1MX digipeater, on a nice tall building at MIT, does this.

Also, the TAPR TNC-1 sends out frames to people it was not in contact with under some circumstances. One I have seen on the screen (using the WA8DED monitoring features) goes like this:

> W1AAA is connected to W1ZZZ.
> W1AAA disconnects by sending DISC.
> W1ZZZ sends UA to W1AAA, but it doesn't get there for one reason or another.
> W1ZZZ thinks he is disconnected.
>
> A packet goes by from W1BBB to W1CCC via W1DDD, W1EEE.
> [This one may have to be a non-info frame; I'm not sure.]
> W1ZZZ hears it go by.
>
> W1AAA retries the DISC which he didn't hear acknowledged.
> W1ZZZ, a buggy TNC-1, never in contact with or addressed by W1CCC, sends a DM to W1CCC via W1DDD, W1EEE!!!

Well, it's just a hobby.

73,
Bob, ARPAnet: clements@bbn
K1BC Usenet: {decvax, ihnp4, linus, ...}!bbncca!clements

From -3848666685597666074
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f405f8844475a1fb,start
X-Google-Attributes: gid11bd51,public

X-Google-ArrivalTime: 1985-11-07 19:43:08 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: IEEE Journal article
Message-ID: <351@mit-eddie.UUCP>
Date: Thu, 7-Nov-85 22:43:08 EST
Article-I.D.: mit-eddi.351
Posted: Thu Nov 7 22:43:08 1985
Date-Received: Sat, 9-Nov-85 05:52:12 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 18

From: Keith Petersen <W8SDZ@SIMTEL20.ARPA>
    Oops, almost forgot. The May 1985 issue of the IEEE Journal on
    Selected Areas in Communications carries the article "Packet
    Radio in the Amateur Service", by Harold Price, Bob Diersing, and
    yours truly.

Phil, if this article is available in machine-readable format and if
permission can be gotten to release it to the public-domain, I'd like
to have a copy for the PD archives here at SIMTEL20. IEEE Journal is
a rather limited circulation magazine that isn't generally available
to people who are not members.

73,
--Keith
Arpa: W8SDZ@SIMTEL20.ARPA
uucp: ...!seismo!SIMTEL20.ARPA!W8SDZ
uucp: ...!{decvax,unc,hao,cbosgd,seismo,aplvax,uci}!brl-bmd!w8sdz
uucp: ...!{ihnp4!cbosgd,cmcl2!esquire}!brl-bmd!w8sdz

From 4285441330234480342
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6d09cd6a7b5a983b
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-08 07:55:44 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site adiron.UUCP
Path: utzoo!watmath!clyde!bonnie!akgua!mcnc!duke!adiron!tro
From: tro@adiron.UUCP (Tom Olin)
Newsgroups: net.ham-radio.packet
Subject: Re: The League Responds
Message-ID: <295@adiron.UUCP>
Date: Fri, 8-Nov-85 10:55:44 EST
Article-I.D.: adiron.295
Posted: Fri Nov 8 10:55:44 1985
Date-Received: Wed, 13-Nov-85 07:42:07 EST
References: <677@petrus.UUCP>

Organization: PAR Technology, New Hartford, NY
Lines: 9

I realize that there will be some lag time between the receipt of an
article and its publication, but 8 months (March to November) seems a
little extreme, especially when the article deals with rapidly changing
technology. Was this an isolated case, or is it the norm for QST?

If 8 months is a reasonable lag time, perhaps the computer/software
industry has been ignoring the publishing industry.

Tom - WB2HLY

From -1847580853405123265
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,370149571d2b715e
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 122486,847e48a55693a5a2
X-Google-Attributes: gid122486,public
X-Google-ArrivalTime: 1985-11-10 08:04:12 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.3 alpha 4/3/85; site ukma.UUCP
Path: utzoo!watmath!clyde!cbosgd!ukma!david
From: david@ukma.UUCP (David Herron, NPR Lover)
Newsgroups: net.news.group,net.ham-radio.packet
Subject: Re: Reducing costs to USENET backbone sites, packet radio
Message-ID: <2366@ukma.UUCP>
Date: Sun, 10-Nov-85 11:04:12 EST
Article-I.D.: ukma.2366
Posted: Sun Nov 10 11:04:12 1985
Date-Received: Mon, 11-Nov-85 06:36:15 EST
References: <598@aicchi.UUCP> <838@psivax.UUCP> <534@rti-sel.UUCP>
Reply-To: david@ukma.UUCP (David Herron, NPR Lover)
Distribution: net
Organization: Univ. of KY Mathematical Sciences
Lines: 27
Xref: watmath net.news.group:4446 net.ham-radio.packet:121

In article <534@rti-sel.UUCP> jb@rti-sel.UUCP (Jeff Bartlett) writes:
>Has anyone else noticed the quiet revolution that is happening in
>net.ham-radio.packet?

Yes. It's almost enough for me to want to become a ham so I can join
in on the fun. (That d*mn code test bothers me).

>Devices known as Terminal Node Controllers (TNCs) are used to implement
>a packet network, similar to ethernet, using the AX.25 protocol,
>300 baud modems, and radio links.
> ...
>A radio linked USENET would:
>   - not be at the mercy of Ma-Bell.
>   - be very fault-tolerance.

>   - be highly connected.
>   - be able to handle more traffic at almost flat cost.
>   - etc.......
>

Very nice possibility. But doesn't a packet radio net have the
same problem that StarGate will have? i.e. respolsibility for
carrying 'libelous' postings? In fact, I seem to recall a posting
in ham-radio.packet saying just that.
--
David Herron, cbosgd!ukma!david, david@UKMA.BITNET.

English is a second language to me -- Baby talk was my first language.

From -6385850919589855202
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,4aac945e432e6fba,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-10 18:13:20 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site inuxi.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!inuxc!inuxi!wheatley
From: wheatley@inuxi.UUCP (Steven Wheatley)
Newsgroups: net.ham-radio.packet
Subject: tapr tnc-2 info
Message-ID: <262@inuxi.UUCP>
Date: Sun, 10-Nov-85 21:13:20 EST
Article-I.D.: inuxi.262
Posted: Sun Nov 10 21:13:20 1985
Date-Received: Tue, 12-Nov-85 03:40:04 EST
Distribution: net
Organization: AT&T Consumer Products, Indianapolis
Lines: 32

Just called tapr.....a few suggestions were posted on the answering
machine...

1. place tape on top of the lithium battery before installing the
tnc board in the cabinet. This is to prevent the battery from
touching the top of the cabinet, which could cause the battery to
explode.

2. If you are using tnc2 with some radio shack computers (i think
he said radio shack models 3 and 4) they suggest you remove R14,
R15, and R16. If you don't, these resistors get VERY hot. I guess
the radio shack computers supply a voltage on the DB25 pins 6,9, and
10, or in some other means cause a good deal of current to flow thru
these R's.

My note....

(Maybe it is a good idea to check the schematic for your terminal or computer to see if this will be a problem with your setup.....I guess they have heard of the Radio shack models having the problem, but there are probably more....)

I am experiencing a problem, during testing, where the digital loop back test does not function properly. Another ham locally has noticed the same problem; he received the kit the same day as i. If i find out anything on this problem that may be of general interest, will post.

steve wheatley
ku9c
inuxi!wheatley

From -250619293428050419
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d7cefe67428f5340,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-11 18:44:04 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site inuxi.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!inuxc!inuxi!wheatley
From: wheatley@inuxi.UUCP (Steven Wheatley)
Newsgroups: net.ham-radio.packet
Subject: TAPR TNC-2 INFO
Message-ID: <263@inuxi.UUCP>
Date: Mon, 11-Nov-85 21:44:04 EST
Article-I.D.: inuxi.263
Posted: Mon Nov 11 21:44:04 1985
Date-Received: Wed, 13-Nov-85 07:18:43 EST
Distribution: net
Organization: AT&T Consumer Products, Indianapolis
Lines: 66

The following was forwarded to me by n9cza....it may help you who are putting together your tnc-2's

11/05/85
To: ALL, please give widest coverage
Fm: TAPR
Re: Problems with TNC 2 rev 2.

The first of the second shipment of TNC 2s has hit the field, and some problems have been identified.

The following information applies only to TNCs with an ORDER NUMBER greater than 511, those that say Rev 2 below U21.

Symptom: During the test on page 44, the STA light fails to go

out.

Solution: The manual fails to tell you to install U24, the second 6264-L. Remove power and install this chip.

Symptom: The digital loopback test on pages 47 & 48 fails. No CONNECTED message is displayed.

Solution: SOME, not all, of the state machine proms (U6) were programmed incorrectly. To see if this is your problem, perform the following steps:

1) Remove power
2) Remove U5(74HC374) and U6(2716 marked STATE) and place on the black protective foam.
3) Install a jumper between U21 pins 13 and 14.
4) Install a jumper between U21 pins 12 and 15.
5) Check for shorts.
6) Apply power, try digital loopback test again.

If the test succeeds, you have a bad U6. To double check, swap U6 with any other working state machine, either from a TNC 2 rev 1 board, a working TNC 2 rev 2, or the K9NG 9600 baud modem board.

If your U6 is bad, put it on a small piece of the black foam, put the chip and foam in the small box your sockets came in, and send the box back to TAPR. We will return it asap by first class mail.

Symptom: Your front panel is missing.
Solution: No one got one. A sheet notifying you of this was left out of the box. The panels will be sent to you via first class mail by the end of the week.

Symptom: Your board says Rev 2, but the manual says Rev 3.
Solution: Replace Rev 3 with Rev 2 in the manual. There is no Rev 3.

We apologize for these problems. Remember, the preceding applies only to TNC 2 order numbers greater than 511 (rev 2). Owners of TNC 2 rev 1 (order numbers less than 512) will want to be sure to see the next PSR, it contains information on how to upgrade your TNC to rev 2. PSR should be mailed in the next 7 days.

TAPR

From 4997295071054564185
X-Google-Language: ENGLISH,ASCII-7-bit

X-Google-Thread: 11bd51,59467d6767a56cd4,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-13 06:39:32 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site decwrl.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!qantel!lll-crg!ucdavis!ucbvax!decwrl!dec-rhea!dec-ptovax!wood
From: wood@ptovax.DEC
Newsgroups: net.ham-radio.packet
Subject: Standard Freqs. for HF packet?
Message-ID: <1411@decwrl.UUCP>
Date: Wed, 13-Nov-85 09:39:32 EST
Article-I.D.: decwrl.1411
Posted: Wed Nov 13 09:39:32 1985
Date-Received: Fri, 15-Nov-85 05:40:36 EST
Sender: daemon@decwrl.UUCP
Organization: Digital Equipment Corporation
Lines: 6

[Standard Freqs. for HF packet?]

Does anyone know of any "standard" freqs. for packet (PBBS or Gatways) on the HF bands?

73s de Terry, WA3VQJ in Pittsburgh
!decwrl!dec-rhea!dec-ptovax

From -7256801347395840 62
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,4b563861e9b44b5b,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-14 20:13:53 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site inuxi.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!inuxc!inuxi!wheatley
From: wheatley@inuxi.UUCP (Steven Wheatley)
Newsgroups: net.ham-radio.packet
Subject: Gateway Vol 2, #6
Message-ID: <264@inuxi.UUCP>
Date: Thu, 14-Nov-85 23:13:53 EST
Article-I.D.: inuxi.264
Posted: Thu Nov 14 23:13:53 1985
Date-Received: Sat, 16-Nov-85 08:39:36 EST
Distribution: net
Organization: AT&T Consumer Products, Indianapolis
Lines: 404

Gateway: The ARRL Packet-Radio Newsletter
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203-666-1541

Editor:
Jeffrey W. Ward, K8KA

GATEWAY TO CHANGE EDITORS

This will be the last issue of Gateway that I edit. In mid-November, I will begin a two-year leave of absence from the ARRL. I will spend the two years working and studying with the UoSat project at the University of Surrey, in England. Since I will be working on the UO-11 Data Communications Experiment (DCE) and on PACSAT, I hope to remain involved in amateur packet radio and to provide you with packet-radio news from Europe.

The new editor of Gateway will be Ed Raso, WA2FTC. In the past, Ed was editor of the ARRL Radio Club News, and he is now sysop of the Ham Radio Net BBS and chairman of a new Amateur-Radio information service called HAMLINK (see the "HAMLINK" item in this issue). Ed is enthusiastically involved in packet radio and in distribution of packet-radio information. I am sure that you will enjoy his tenure as Gateway editor. You can help him get started by sending news items to Gateway at ARRL headquarters. Thanks for taking over, Ed.

I have enjoyed editing Gateway, and would like to thank you all for supporting our effort to keep the packet-radio community informed.

Jeffrey W. Ward, K8KA.

PACKET ON SHUTTLE?

AMSAT and the ARRL have sent a proposal to NASA requesting permission to develop a second Shuttle Amateur Radio Experiment (SAREX). SAREX I was the well-received W0ORE SSTV experiment, and the proposed SAREX II would be a packet-radio experiment conducted by Dr. Ron Parise, WA4SIR. Ron, who will be a payload specialist on STS 61-E, has expressed a great desire to use packet radio from the shuttle.

SAREX II, if approved, will use a modified TAPR TNC-2, the Motorola 2-meter HT used by Drs. Garriott and England, and a lap-top microcomputer. The following "wish list" of operation modes is from in the AMSAT/ARRL proposal:

"The SAREX II experiment will have the capability to

operate in several modes. Actual selection will depend on a number of factors including power considerations, operator availability, Shuttle location and other mission activities. The modes available are as follows:

"BEACON: (Unattended) Periodic transmission of an identifying text sequence. This sequence can be used by all ground stations for tracking and identification. Depending on configuration, this text can be from one line to several lines in length and may consist of a mission status report entered by the operator.

"KEYBOARD TO KEYBOARD EXCHANGE (Attended): This involves two-way real-time communication between the SAREX II operator and specific ground stations...

"STORE AND FORWARD MESSAGE DELIVERY (Unattended): This mode allows designated ground stations to access the SAREX II computer to post and retrieve stored messages. Such messages might be either for the SAREX II operator or another ground station, perhaps on the other side of the earth. (It is envisioned that this mode might be used to demonstrate the PACSAT concept...

"REAL-TIME RELAY (Unattended): This allows the use of the SAREX II to relay data between ground stations, just as Packet ground stations customarily do. This mode allows the SAREX II computer to be powered down to conserve power.

"ROBOT (Unattended): This mode allows ground stations to establish contact with SAREX II and receive a customized, but automated, acknowledgment. The rapid handling of such automatic contacts permits a large number of stations to participate in the experiment."

The SAREX II proposal has just been submitted to NASA, and the AMSAT Board of Directors will be discussing financing for the project at their general meeting (November 8 and 9). If SAREX II is approved, it will be up to packet radio clubs to make good use of the mission. It will be a good opportunity to show high-technology Amateur Radio in action.

Via DRNET.

PACKET TRAFFIC DURING EARTHQUAKE

During the recent Mexico City earthquake, Syl Gookin, N1DKF, used packet radio to forward health and welfare messages to NTS stations in Texas. The messages were stored on Syl's MailBox in Rhode Island, went from there to W0RLI on 2 meters, and then on to the W5XO MailBox on 20 meters. Syl says that most of the messages made the trip in less than 24 hours, and some replies

reached his MailBox in as little as 36 hours. The messages were written as standard NTS radiograms, so that the Texas stations would have no trouble introducing them to NTS voice nets. Syl summarizes that "this method required minimal operator time, used alternatives to otherwise busy traffic channels, is error free, fast, and it works...because packet folks have exerted a large effort to put the packet network in place prior to the emergency and the folks at both ends of the link made the effort to handle the traffic."

From N1DKF and NEPRA PacketEar.

HAMLINK

For several years, CompuServe HAMNET has been providing an electronic conference addressing all aspects of Amateur Radio. The packet-radio section on HAMNET has been a vital meeting place for those interested in computers and Amateur Radio. Now, there is another on-line Amateur Radio conference. The conference is called HAMLINK, and it is a part of PLINK, a new low-priced time-sharing service. HAMLINK's chairman is Ed Raso, WA2FTC, who is soon to be the editor of Gateway. Ed has been running a dial-up BBS called Ham Radio Net for more than a year, and the popularity of this BBS convinced Ed to become part of the PLINK time-sharing system. All of the programs that have been mentioned in Gateway as being available on Ham Radio Net are now available on HAMLINK, including the W0RLI MailBox, the KE3Z Multiport Digipeater and the WDCG PBBS-PC. For more information on PLINK call 800-524-0100. Mention HAMLINK to receive a special bonus.

From WA2FTC.

CANADIANS WORK ON PRESENTATION LAYER

We received the following from Syd Horne, VE3EGO:

"At the Radio Society of Ontario / CRRL Convention in London, Ontario in September, Syd Horne, VE3EGO, and members of the Belleville TELIPAK group presented a paper on TELIPAK -- a system which provides the capability for amateurs to exchange high-resolution, error-free, digital color images, text and speech. We expect that such a system will be of interest to all packeteers.

"TELIPAK is an acronym derived from TELIDON and packet radio. TELIDON is the Canadian version of VIDEOTEXT, and is based on NAPLPS, the North American Presentation Level Protocol Syntax, which is an ISO layer-6 protocol.

"The TELIPAK software package is easy to use and runs on an IBM PC or compatible...The software package includes page creation

software together with the ability to remotely control the ROBOT 1200C scan converter (used as a digitizer), a TNC and a text-to-speech convertor."

Syd reports that the group will be transmitting their first pictures this month. The software will be customized for each user and should be available early in 1986. For more information, contact:

Syd Horne, VE3EGO
531 Victoria Ave.
Belleville, ONT, K8N 2G6

From VE3EGO.

TNC-2 UPDATE

With 1200 TNC-2 kits sold and two commercial manufacturers marketing TNC-2 clones, TAPR is "basically done" with TNC-2 production. The TNC-2 has been another success for TAPR, and software enhancements introduced in the TNC-2 are already appearing in commercial TNCs.

People who bought TNC-2s early on (before serial number 501) should watch the next issue of the TAPR PSR Quarterly. This newsletter will provide details on how to upgrade TNC-2 Rev-1 pc boards to TNC-2 Rev-2 boards. Rev-2 boards have extra RAM, a better heat sink for the power supply, less RFI, enhanced software and a few other nice additions.

If you still want to build a TNC-2 kit, don't despair. GLB, manufacturer of the PK-1 and PK-1L TNCs, is introducing a TNC-2 clone called the TNC-2A. The TNC-2A kit uses the same documentation, software and hardware (including the low-profile cabinet) as the TAPR TNC-2. Although standard TNC-2As will use some NMOS parts, a low-power, all-CMOS version will also be available. TNC-2A is priced at $170, and should be available before Christmas. To place an order, contact:

GLB Electronics
151 Commerce Parkway
Buffalo, NY 14224
716-675-6740.

From WB9FLW and GLB.

TUNING INDICATOR FOR HF PACKET

If you are looking for a commercial tuning indicator for use with packet, an item in the October issue of the NEPRA PacketEar describes how to modify the AEA TI-1 for packet. According to

the article "AEA would be pleased to modify and calibrate the TI-1 for a small charge (plus return shipping). Performing the modification yourself does not alter the warranty in any way." For more information, contact:

Advanced Electronic Applications, Inc.
P.O. Box C-2160
Lynnwood, WA 98036.

From the NEPRA PacketEar.

NEW MISSISSIPPI CLUB ADDRESS

The address of the Mississippi Amateur Radio Digital Association (MARDA) has been changed to:

MARDA
c/o Patrick J. Fagan, WA5DVV
2412 E. Birch Drive
Gulfport, MS 39503.

From WA5DVV.

PACKET REPORT FROM IOWA

The Central Iowa Technical Society (CITS) meeting in late October generated a couple of newsworthy items. First, CITS members voted to move to the recognized national packet frequencies: 145.01 through 145.09 MHz. This will help Iowa link to surrounding states. At least until the end of this year, the WA0JFS MailBox will provide service to both 147.555 MHz and 145.01 MHz, easing the transition to 145-MHz bandplan. Packeteers in eastern Iowa will be moving down to 145.01 MHz by the end of the year, helping complete links from Iowa to Illinois and Minnesota. A second item of interest is that the CITS Link Management Unit (LMU) project is slowly moving forward, with two K9NG 9600-bit/s modems and two FM-5 transceivers on hand. The LMU is a network controller that will be used to pass traffic between a 2-meter network and a 220-MHz backbone system.

Via WA0JFS, DRNET.

LONG ISLAND PACKET CLUB

Packeteers of Long Island (POLI) is a new packet radio club that covers all of New York's Long Island. Long Island is in an interesting position, in that those on the east end of the island can get into Boston, Massachusetts, and those on the western end of the island communicate easily with New York City and the population centers in New Jersey. The "POLINET" on Long Island

will connect two of the busiest parts of EASTNET. For more information on POLI, contact:

POLI
c/o L. Jacobs, KA2EYW
3 Jet Lane
Holbrook, NY 11741.

From POLI Newsletter.

PACKET RADIO ON THE MOVE -- THE CLUB CONNECTION

(Third in a series by Steve Place, WB1EYI, Manager, ARRL Volunteer Resources Office.)

The long-anticipated harvest has arrived. You and your packeteering cohorts have plowed the local ham radio soil deeply and sowed the seeds of the packet mystique on fertile ground. The result? A bumper crop of potential packet radio novitiates.

What if You Threw a Party and EVERYONE Showed Up?

The gang is here. Your Section Manager and a number of his appointees: STM, TC, ATCs, PIOs and ACC. A few techno-klutzes, a few techno-whizzes and a skeptical bunch from the local computer club. And rounding out the team is the usual crowd of curious thrill seekers. They mumble softly in restless clusters around the meeting room, eager to be initiated into the loudly heralded wonders of packet radio. Hmmm . . .

Obviously, your club's first official meeting is the key event in getting packet radio rolling locally. Now what? The answer lies in knowing what you want to accomplish. The typical reasons for holding a "kick-off" meeting (and for originally forming the club) can be summarized as follows:

* expanding the local packet radio user base (the Numbers and Nodes game, not to be confused with Dungeons and Dragons)
* getting more people to participate actively in cooperative, local packet radio projects

What must you accomplish at the kick-off meeting to begin gnawing away at skepticism, cynicism and all the other "-isms" that sap enthusiasm and get in the way of progress? All you have to do is:

* conduct your meeting so that every person in your widely varied audience feels you're talking to him -- command his attention and fire his enthusiasm;
* convince each person in attendance that packet radio meets a personal need and is an essential addition to his shack;
* convince each participant that your club offers a variety of irresistible opportunities for his active involvement -- chances to make truly

meaningful contributions to the local community
through the club.

If you can accomplish all that in one meeting and walk away with sincere commitments from everyone, put down this issue of Gateway immediately, run (don't walk) to your wordprocessor and write to ARRL, Personnel Office, 225 Main St., Newington CT, 06111. The rest of us mere mortals, however, will be faced with an ongoing task and the need to persevere. Though you won't conquer all your visitors at the kick-off meeting, you can stack the deck to improve your chances.

The Welcome

The gang must be made to feel welcome. If you want them to listen (let alone show up again), your "inner core" of diehard packeteers must become an "outgoing corps" of packet radio evangelists. No hand can go unshaken; no nervous smile can go ignored; no question, however obvious, can go unanswered. Placing a stack of stick-on name tags and marking pens at the door and writing your guests' first names, callsigns and organizations boldly and legibly on the non-sticky side (just checking...) will help as the night progresses. A table or two of complimentary refreshments can give people something to do while they're trying to figure out what to do. All of your preparation and all of your rehearsing should long since have been done, and each of your founding packeteers should be "working the crowd."

Startup and Reading Your Audience

Within a few minutes of the scheduled starting time, your warmest, most personable and well-spoken packeteer should call the meeting to order -- informally and with a broad smile. Keep it light and loose. He should extend a formal welcome on behalf of the club and work his way (conversationally) around the room. Who's there? Where are they from? Are they equipped for packet radio? What are their ham radio and/or computer interests? In fifteen minutes or so, you and everyone else will have a pretty good idea of how the group stacks up and where your focus should be -- and latecomers won't have missed anything essential.

Packet Radio Overview and Tutorial

When everyone has settled in comfortably, note aloud that the assemblage is surely a mixed bag: Extra Class through Novice licensees, non-ham computer hobbyists, experienced packeteers and neophytes, and representatives of a diverse wealth of amateur radio expertise and experience. The one thing they all have in common is an interest in exploring the world of packet radio.

It would make sense, therefore, to briefly go over what packet radio is, how it works, what its advantages are over other modes

or techniques and the state of the local packet scene is. If your gang of packeteers is blessed with more than one warm, outgoing, well-spoken member, have your welcomer hand the ball off to him. No successful club is a one-man show; this is a great chance for your guests to meet several of those who are already members of the club.

At this point, your meeting will be running under full steam...just as this installment at this point is running out of steam (i.e. space).

What remains? The menu for the next installment includes the introduction to packet radio, a multistation hands-on demonstration, special-interest working groups, study assignments for the following meeting, and most important in getting the real work of the club done, adjournment to a local eatery/bistro for creative brainstorming and -- the cornerstone of any successful club -- having fun!

    From WB1EYI.

REPRODUCTION OF GATEWAY MATERIAL

Material may be exerpted from Gateway without prior permission, provided that the original contributor is credited and Gateway is identified as the source.

From -8188023350489260119
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e7293c100380bccb,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,e7293c100380bccb,start
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1985-11-14 21:35:17 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxt!houxm!vax135!mtunh!ky2d-2!ai2q
From: ai2q@ky2d-2.UUCP (Alex)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: Shugart SA-901 documentation
Message-ID: <52@ky2d-2.UUCP>
Date: Fri, 15-Nov-85 00:35:17 EST
Article-I.D.: ky2d-2.52
Posted: Fri Nov 15 00:35:17 1985
Date-Received: Sat, 16-Nov-85 01:48:23 EST
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 12
Xref: watmath net.ham-radio:3552 net.ham-radio.packet:129

*** REPLACE THIS LINE WITH YOUR MESSAGE ***

I recently acquired a brand new Shugart Type SA-901 eight-inch disk drive. My present Xerox 820-based packet radio bulletin board and message server runs two Shugart SA-800s. According to the SA-800 manual, the SA-901 will also be applicable to expand the PBBS storage capacity. My problem is I have no data providing the cardedge signals for the SA-901. Does anyone have the required pinout information? I'd be more than happy to photocopy same and return the material, pay postage, etc. OR, a simple listing would be sufficient! Am also looking for power supply requirements (specs). many thanks to whomever can supply this much needed info. Running out of disk space! Very 73 de Alex, AI2Q, Freeport, Long Island, New York >>AR>>

From 613002236281640206
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,c6bdf50c0af00f1f,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-14 21:50:15 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!drutx!mtuxo!mtunh!ky2d-2!ai2q
From: ai2q@ky2d-2.UUCP (Alex)
Newsgroups: net.ham-radio.packet
Subject: Re: Icom 2AT PTT
Message-ID: <53@ky2d-2.UUCP>
Date: Fri, 15-Nov-85 00:50:15 EST
Article-I.D.: ky2d-2.53
Posted: Fri Nov 15 00:50:15 1985
Date-Received: Sat, 16-Nov-85 08:48:14 EST
References: <370@mit-eddie.UUCP>
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 26

> From: Richard Gillmann <GILLMANN@USC-ISIB.ARPA>
> I'm just finishing construction of my TNC2 and I'm trying to figure
> out how to interface it to an Icom 2AT handheld. The 2AT doesn't seem
> to have a separate PTT line as the TAPR documentation assumes. From
> reading the 2AT schematic I see that the PTT switch merely interrupts
> the ground return side of the mike. Has anyone had any experience
> hooking up a 2AT to a TNC2 (or for that matter to any kind of
> packet controller)? I'd sure appreciate any advice.
>
> 73,
> Richard N6MPP
> -------

*** REPLACE THIS LINE WITH YOUR MESSAGE ***
Dear Richard:
I've found the easiest way to connect either my GLB TNC (which uses a bipolar keying xstr) or my TAPR TNC1 (which uses a FET) is via small audio xfmr. I've used junkbox specials with roughly 1:1 turns ratio as well as two xfmrs back-to-back to establish an approximate 1:1 ratio.

The Z is abt 600 to 1000 ohms. Simply feed the AFSK from the TNC ouput
into the primary (grounding one end). At the secondary, pick off the afsk
at the xfmr "top" and ffed it to the combined PTT/mic line. Pull the "cold"
end of the secondary to ground with the keying xstr. That's all there is to
it; it works FB here. I've also seen a schematoc where the afsk is fed via small
cap and a resistor is used to pull the line low. I've never tried it but
I see no reason why such a network shouldn't work, and it'll be cheaper.
Good luck es 73 de Alex, AI2Q, Freeport, Long Island, New York >>AR>>

From 4666769519208531425
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,c6bdf50c0af00f1f
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-15 07:34:13 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site anasazi.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!qantel!lll-crg!seismo!hao!noao!terak!mot!
anasazi!john
From: john@anasazi.UUCP (John Moore)
Newsgroups: net.ham-radio.packet
Subject: Re: Icom 2AT PTT
Message-ID: <371@anasazi.UUCP>
Date: Fri, 15-Nov-85 10:34:13 EST
Article-I.D.: anasazi.371
Posted: Fri Nov 15 10:34:13 1985
Date-Received: Mon, 18-Nov-85 07:19:03 EST
References: <370@mit-eddie.UUCP>
Reply-To: john@anasazi.UUCP (John Moore)
Organization: Anasazi, Phoenix Az.
Lines: 21

In article <370@mit-eddie.UUCP> GILLMANN@USC-ISIB.ARPA writes:
>From: Richard Gillmann <GILLMANN@USC-ISIB.ARPA>
>I'm just finishing construction of my TNC2 and I'm trying to figure
>out how to interface it to an Icom 2AT handheld. The 2AT doesn't seem
>to have a separate PTT line as the TAPR documentation assumes. From
I have made a (crude) remote base using the 2AT. It turns out that if
you provide a high impedance path from mic audio to ground when you
want PTT, and leave it open otherwise, it will work. I think about
10K will do it. To find out, just connect a test resistor from
the hot mic lead to ground. Warning: I found out that if you have
it "key down" with this method, and you power it off and on,
it will come up in a wierd state from which it cannot recover
without powering it off, opening the mic lead, and powering it
back on.

--
John Moore (NJ7E/XE1HDO)
{decvax|ihnp4|hao}!noao!terak!anasazi!john
{hao!noao|decvax|ihnp4|seismo}!terak!anasazi!john
(602) 952-8205 (day or evening)
5302 E. Lafayette Blvd, Phoenix, Az, 85018 (home address)

From -4800588348839323335
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,ea73f03315c57bc9,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,ea73f03315c57bc9,start
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1985-11-16 09:57:59 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!houxm!mtuxo!mtunh!ky2d-2!ka2ugq
From: ka2ugq@ky2d-2.UUCP (Tom)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: Info on FTP
Message-ID: <54@ky2d-2.UUCP>
Date: Sat, 16-Nov-85 12:57:59 EST
Article-I.D.: ky2d-2.54
Posted: Sat Nov 16 12:57:59 1985
Date-Received: Mon, 18-Nov-85 05:46:49 EST
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 9
Xref: watmath net.ham-radio:3561 net.ham-radio.packet:137

I have heard many things about FTP, especially for recieving
medium to large-sized files, such as the AX.25 level 2 protocol
specification or something large like that.

Could someone please tell me what FTP is and if (and how) I may
use it?

Thanks and 73's
-Tom Brown KA2UGQ

From 5726414452484810439
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,34f2366e57bc2e5e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-17 01:43:16 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!qantel!lll-crg!gymble!
umcp-cs!seismo!harvard!think!mit-eddie!BRUCE%UWALOCKE.BITNET@WISCVM.ARPA
From: BRUCE%UWALOCKE.BITNET@WISCVM.ARPA
Newsgroups: net.ham-radio.packet
Subject: RE:9600 PACKET RADIO MODEM
Message-ID: <471@mit-eddie.UUCP>
Date: Sun, 17-Nov-85 04:43:16 EST
Article-I.D.: mit-eddi.471
Posted: Sun Nov 17 04:43:16 1985
Date-Received: Thu, 21-Nov-85 05:15:12 EST

Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 12

From: BRUCE%UWALOCKE.BITNET@WISCVM.ARPA
 RE: 9600 Baud Packet radio Modem

     Steve Goode's 9600 baud Hamtronics FM-5 Modifications and Modem
were described in the "Forth ARRL Amateur Radio Computer Networking
Conference" proceedings availible from the ARRL. Also a limited number
of P.C. boards with some of the harder to get parts (some I.C.s, Caps,
etc) based on the paper in the proceedings are available from TAPR.

Bruce Edwards N7EHM

BRUCE%UWALOCKE.BITNET

From 1261113760145401871
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,3f04953a6e2e1650,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-17 08:01:59 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site yojna1.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!seismo!umcp-cs!aplcen!cp1!yojna1!wb6rqn
From: wb6rqn@yojna1.UUCP (Brian Lloyd)
Newsgroups: net.ham-radio.packet
Subject: Re: Re: WA8DED Firmware request
Message-ID: <140@yojna1.UUCP>
Date: Sun, 17-Nov-85 11:01:59 EST
Article-I.D.: yojna1.140
Posted: Sun Nov 17 11:01:59 1985
Date-Received: Thu, 21-Nov-85 21:10:32 EST
References: <438@mit-eddie.UUCP>
Organization: Yojna1 Amateur Radio Packet Unix System; Germantown, Md.
Lines: 11

> [...]
> In any case, I will mail a copy to Bruce as he requested. Let's not
> have a zillion copies going through the gateway.
>

I have the WA8DED source here. Could someone contact Ron Raikes and ask him
if he minds if I make the source code generally available on my UNIX system?
Thanks.

73 de Brian Lloyd, WB6RQN
...![bellcore | cp1]!yojna1!wb6rqn

From 7322323082736174374
X-Google-Language: ENGLISH,ASCII-7-bit

X-Google-Thread: 11bd51,223633e2ea6675e0,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-18 17:03:41 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!drutx!mtuxo!mtunh!ky2d-2!ka2ugq
From: ka2ugq@ky2d-2.UUCP (Tom)
Newsgroups: net.ham-radio.packet
Subject: Re: Circuit diagram of 9600 Baud modem?
Message-ID: <55@ky2d-2.UUCP>
Date: Mon, 18-Nov-85 20:03:41 EST
Article-I.D.: ky2d-2.55
Posted: Mon Nov 18 20:03:41 1985
Date-Received: Wed, 20-Nov-85 00:18:45 EST
References: <449@mit-eddie.UUCP>
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 32

> Hello!
> Where can I get a circuit diagram of the 9600 Baud packet radio modem?
> vy 73
>   Karl-Heinz   DK8HI

If you would like information about the K9NG 9600 baud modem,
I would suggest you contact TAPR (Tuscon Amateur Packet Radio) at:

Tuscon Amateur Packet Radio Club
P.O. Box 22888
Tuscon, Arizona 87534

They should be able to tell you all you would like to know about
Steve Goode's 9600 baud packet TNC.

One other place to look for information on the modem is in the
Gateway newsletter - Volume 2, Issue 2, September 4, 1985. There
is an article around page 6 entitled, "K9NG MODEM PROJECT".

The PC-board is supposed to be designed to connect a TNC and a
Hamtronics FM-5 220 MHz transceiver. Other transceivers can be
substituted, with appropriate modifications to the modem board.

This will not be a step-by-step project for the beginning kitbuilder,
but the documentation provided with the board and the article that
Steve submitted to the proceedings of the fourth ARRL Amateur Radio
Computer Networking conference (available for $10 from the ARRL)
should allow experienced builders to assemble and test the modem.

Hope that was helpful!

-Tom Brown KA2UGQ

From -1642645137449479437

X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f41339a08f137813,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-18 22:53:01 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site pur-ee.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!inuxc!pur-ee!shields
From: shields@pur-ee.UUCP (Jeffrey Shields)
Newsgroups: net.ham-radio.packet
Subject: 145.01 Mhz congestion
Message-ID: <3515@pur-ee.UUCP>
Date: Tue, 19-Nov-85 01:53:01 EST
Article-I.D.: pur-ee.3515
Posted: Tue Nov 19 01:53:01 1985
Date-Received: Wed, 20-Nov-85 00:43:39 EST
Organization: Electrical Engineering Department , Purdue University
Lines: 116

We have been putting together a packet radio network in the midwest
on 145.01 Mhz and are beginning to experience some of the congestion
problems that have been going on for some time in other more heavily
populated areas of the country. In a few years when the network
is better (high speed links on 220 Mhz and above, smarter digipeaters,
network node controllers, etc.) most of these problems will probably go away.
In the meantime we have been thinking of ways to cut down on the congestion,
and are interested in approaches that other groups have been using.
Here are some of the ideas that we have been discussing locally :

General things:
- Agree on some standard value for DWAIT in your area (the time each TNC
  waits after channel is clear before sending a packet). Most people are
  probably using the default, which is ok as long as it has the same value
  from one manufacturer to another, and as long as everyone sticks to it.
- Coordinate frequencies through state repeater council, using the other
  "packet frequencies" (145.03, 145.05, etc.) for local QSO's, local BBS's,
  etc.
- Coordinate Bulletin Board tasks. I understand that in New Jersey area, they
  use one BBS for HF gateway only, one for main message server, one for files
  (Gateway, ARRL newsletter, W5YI report, packet maps, etc.), and one for a
  mail trunk to forward messages.

Bulletin Boards (System Operator) (mostly have W0RLI type BBS in mind here)
- If possible, have the BBS located at a station that has good local coverage
  (good antenna, higher power - say 30 watts or so, etc.). Then local users
  can connect directly, rather than having to go through a digipeater.
- Route beacon through one digipeater at most.
- Increase the time between beacons to, say, every 30 minutes.
- Stamp any personal messages and messages to be forwarded as "P"rivate so
  that others won't tie up BBS reading them.
- Set the flag in CONFIG.TNC file to erase messages after they are forwarded.
- If you have a chain of W0RLI BBS's, forward messages to next solid link in

each direction, and let them forward on, rather than trying to connect directly to each BBS through a chain of digipeaters.
- Make up a disk catalog file, which contains a 1 line description of every file on the disk. Then people can quickly see what a file is before tying up the BBS downloading a large file that they really don't want.
- The "J" command, which lists connections and calls heard, seems to be popular, so set length of J list to a reasonable value (say 10 lines).

During "prime time" hours (say 5-11 PM), the following things might help:
- Increase DWAIT above the standard value, so that others have a higher channel priority than the BBS.
- Decrease MAXFRAME so that fewer packets are sent at once, which ties up digipeater for less time per transmission and reduces collisions. Although, looks like there would be a higher protocol overhead (need more ACK's from receiver) for smaller MAXFRAME.
- Is there some optimum combination of TNC settings for a BBS? I see from the W0RLI sysop manual that W3IWI and others use SENDPAC $0D, MAXFRAME 5, and DWAIT 36 (TAPR-2). Some fellows in this area are using SENDPAC $7F and lower MAXFRAME to send everything out in 128 byte packets. Also, when using a longer DWAIT on the BBS, we have had some timing problems that seem to cause a lot more retries than normal (which makes the congestion problem worse).
- Seems like there are some trade-offs here between utilizing the channel more efficently and utilizing the BBS more efficently. During prime time, we could set the TNC parameters to give the channel (i.e. non-BBS users on frequency) higher priority at the expense of slower BBS throughput, and then at other times maybe we could bump up the BBS priority.
- When forwarding messages, you would probably want good BBS throughput. This can be done now by setting the TNC parameters in the FWD.TNC file, but is there a way at present to set BBS parameters automatically during a designated "prime time" segment? Maybe a possibility for future software release? Also during this "prime time" segment, you could have software disable file transfers to cut down on BBS traffic.
- Some people are in favor of solving these problems by getting the BBS's off of 145.01 altogether. But then very few can connect because we have no digipeaters on other frequencies right now (one reason for having BBS located at a station with good local coverage).

Bulletin Boards (Users)
- If possible, connect directly rather than going through a digipeater.
- Stamp any personal messages and messages to be forwarded as "P" so that others won't tie up BBS reading them.
- Erase any messages addressed to you after you read them.
- Refrain from long file transfers during "prime time" hours (say 5-11 PM). If you're using your PC as a terminal, it may be possible to set up your terminal software to wake up in the wee hours and download the file to your printer or disk. This can be done, for instance, with MEX114.COM (for details see file PD:<CPM.MEX>AUTOMEX.IQF.1 on simtel20).
- If you receive a lot of mail at a BBS, it might be useful to set up your home station to look like a BBS using the CTEXT string and have the BBS forward everything to your station in the wee hours (see recent TAPR Packet Status Register for details).
- Refrain from DX'ing other BBS's through multiple digipeaters during "prime time" hours. The experience here has been that (if you connect at all) the

  throughput is very slow because of the high number of collisions.

Packet QSO's in general
- Stick to the agreed upon value of DWAIT.
- Don't route beacons through multiple digipeaters.
- Make beacon text short and to the point. Seems like Name/QTH would do.
- Increase beacon time or, after the novelty wears off, maybe just refrain from
  beacons altogether, especially during "prime time".
- For local QSO's, connect directly and QSY to another frequency if possible.
- Refrain from DX'ing through multiple digipeaters during "prime time" hours.
  (Although, that's probably the time when everyone is around to be connected
   to .... same problems with throughput mentioned above, though.)

Well, anyway, those are some of the things we are thinking about here. At this point, none of this is carved in stone. While most of the suggestions seem fairly reasonable (and may be in practice by most already), it will take the cooperation of everybody to make it all work.
Maybe we should view these "national packet radio calling frequencies" as a scarce, shared resource. I had 145.01 Mhz in mind when I wrote this, but I understand that a lot of the same problems are cropping up on 14.103 Mhz also. Looks like the main tasks ahead will be to make everyone aware of the problem, openly discuss the alternatives, and adopt some reasonable guidelines that everyone can live with until we go on to the next level of the network.

We are interested in hearing other people's thoughts on all of this.

73's .... Jeff Shields N9CZA (ihnp4!pur-ee!shields)
          W.Lafayette,Indiana

From 9013232787938830717
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d2e1042f7131456d,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-19 05:36:33 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!
Charles_R._Carpenter.DlosLV@Xerox.ARPA
From: Charles_R._Carpenter.DlosLV@Xerox.ARPA
Newsgroups: net.ham-radio.packet
Subject: Re: TAPR TNC-2
Message-ID: <491@mit-eddie.UUCP>
Date: Tue, 19-Nov-85 08:36:33 EST
Article-I.D.: mit-eddi.491
Posted: Tue Nov 19 08:36:33 1985
Date-Received: Thu, 21-Nov-85 22:12:31 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 8

From: CRC.DlosLV@Xerox.ARPA

I'd suggest the Kantronics TNC. It will do all the things a TAPR will at
less cost and it's already built. I was up and running within an hour
with mine. Detailed documentation is a problem however. You get
only a simple users manual of what but no how.

     Chuck...   W5USJ

From -9135018391155295956
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,35a0afbf7e5ea87b,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-19 11:42:29 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site yojna1.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!seismo!umcp-cs!aplcen!cp1!yojna1!wb6rqn
From: wb6rqn@yojna1.UUCP (Brian Lloyd)
Newsgroups: net.ham-radio.packet
Subject: Selecting a TNC
Message-ID: <149@yojna1.UUCP>
Date: Tue, 19-Nov-85 14:42:29 EST
Article-I.D.: yojna1.149
Posted: Tue Nov 19 14:42:29 1985
Date-Received: Sat, 23-Nov-85 09:24:07 EST
Distribution: net
Organization: Yojna1 Amateur Radio Packet Unix System; Germantown, Md.
Lines: 56

Many people are now interested in packet radio and are trying to decide which
TNC to buy. Well there are many options and your choice must be made based on
the hardware and software features you desire. There are two main TNC designs
both from TAPR. They are the TNC1 and the TNC2. The TNC1 is currently
available from AEA as the PKT-1, and from Heath as the HD-4040. There are
other sources for boards and parts if you are motivated to "roll you own".

The TNC2, also from TAPR, is available from AEA as the PK-80, and from GLB in
kit form as the PK-2A.

Your inteneded use will will determine the one you should buy. The
TNC2's seem to be best suited to the job of interfacing to a dumb terminal.
The TNC1 standard firmware is OK in this respect, but I feel that the
latest release of TNC2 firmware is better than the standard TNC1 firmware.

There is a firmware release from Ron Raikes, WA8DED, that makes the TNC1 my
current choice. The DED firmware (as it is called) supports multiple
connections simultaneously, and has a special host interface. This host
mode greatly simplifies interfacing the TNC1 to your computer. Note,
this interface does not look at all like the TNC command structure so you
will have to write your own TNC to Computer interface program.

There are two other TNCs that need some mention here. They are the Kantronics
and the GLB PK-1. Both of these units share the same system for generating
the packets. These units use a software frame generation scheme rather than

the hardware approach used in the TNC1 and the TNC2. The problem with the software approach is that it is slow and difficult to modify. In the future we will be using higher speeds, probably 9600bps locally, with the network backbone running at 56Kbps or faster. None of the software based TNCs can be adapted to the faster speeds. Also, you are at the mercy of the hardware vendor, either Kantronics or GLB, for software updates. It is unlikely that Joe Ham and Computer Hacker will be creating new firmware for these units the way that Ron Raikes did for the TNC1.

What way is best? That is a matter of opinion. I currently lean toward the TNC1 with the DED code, but I am not fond of the 6809 processor it sports. I prefer the TNC2 hardware, but am lukewarm about the current firmware available on it. I am not interested in either the GLB PK-1 or the Kantronics. If price and features are important, and you want it wired and tested, get the AEA PK-80. It will sell for about $220.

If you are a hardware and software hacker, the Xerox 820 boards are interesting. The X820 can be turned into a full-blown CP/M system and TNC for about $350. The packet software for the X820 was written by Phil Karn and is in the public domain (FYI, the TNC2 development took place on the X820).

Another potential way to go, if you have an IBM-PC, is to use the dual packet port board developed by Terry Fox, WB4JFI. This board is in the prototype stages but several wire-wrap versions exist. This board consists of a Zilog 8530-SCC with two world modem chips.

There you have it, a not-so-comprehensive rundown of what is available :-). If you have any questions, let me know.

73 de Brian Lloyd, WB6RQN
...!seismo!umcp-cs!cvl!umd5!obpa1!yojna1!wb6rqn

From -1447599518517670211
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,35a0afbf7e5ea87b
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-20 05:30:54 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site yojna1.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!seismo!umcp-cs!aplcen!cp1!yojna1!wb6rqn
From: wb6rqn@yojna1.UUCP (Brian Lloyd)
Newsgroups: net.ham-radio.packet
Subject: Re: Selecting a TNC
Message-ID: <150@yojna1.UUCP>
Date: Wed, 20-Nov-85 08:30:54 EST
Article-I.D.: yojna1.150
Posted: Wed Nov 20 08:30:54 1985
Date-Received: Sat, 23-Nov-85 09:24:19 EST
References: <149@yojna1.UUCP>
Distribution: net
Organization: Yojna1 Amateur Radio Packet Unix System; Germantown, Md.
Lines: 16

>
> If you are a hardware and software hacker, the Xerox 820 boards are
> interesting. The X820 can be turned into a full-blown CP/M system and TNC for
> about $350. The packet software for the X820 was written by Phil Karn and is
> in the public domain (FYI, the TNC2 development took place on the X820).
>

*** REPLACE THIS LINE WITH YOUR MESSAGE ***

I was incorrect in one of the above statements. Phil Karn's code is not in
the public domain, it is copyrighted. "Hams" are free to copy it and use it
for non-commercial purposes so long as the author is credited. Sorry for the
misinformation.

73 de Brian Lloyd, WB6RQN
...!seismo!umcp-cs!cvl!umd5!obpa1!yojna1!wb6rqn

From -337297050664182856
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,c1ff3b98b05a2d39,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-21 19:54:32 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!BCN%MIT-EECS@EDDIE.MIT.EDU
From: BCN%MIT-EECS@EDDIE.MIT.EDU
Newsgroups: net.ham-radio.packet
Subject: Problems with the mailing list
Message-ID: <534@mit-eddie.UUCP>
Date: Thu, 21-Nov-85 22:54:32 EST
Article-I.D.: mit-eddi.534
Posted: Thu Nov 21 22:54:32 1985
Date-Received: Sat, 23-Nov-85 10:42:01 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 11

From: Clifford Neuman <BCN%MIT-EECS@EDDIE.MIT.EDU>
Apologies to those people who received numerous copies of Dave Mills'
message. All I can say is "sendmail sux". For some reason our mailer
hung when trying to deliver the message to one of the recipients.
Thus, the mailer was still in the middle of delivering the message
when our system went down 2 days later. Since the system bounced
several times, the mailer had to start from the beginning of the list
each time, and those people near the front got multiple copies.

    ~ Cliff

From 4596532229407428637

X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5b2d15b65d2f67a5,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-23 17:52:51 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site inuxi.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!inuxc!inuxi!wheatley
From: wheatley@inuxi.UUCP (Steven Wheatley)
Newsgroups: net.ham-radio.packet
Subject: GATEWAY Vol 2, no. 7
Message-ID: <266@inuxi.UUCP>
Date: Sat, 23-Nov-85 20:52:51 EST
Article-I.D.: inuxi.266
Posted: Sat Nov 23 20:52:51 1985
Date-Received: Sun, 24-Nov-85 06:43:44 EST
Distribution: net
Organization: AT&T Consumer Products, Indianapolis
Lines: 356

Gateway: The ARRL Packet-Radio Newsletter
Volume 2, Issue 7
November 22, 1985

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Newington, CT 06111

Editor:
Ed Raso, WA2FTC

FROM THE EDITOR

As reported in the last issue, Jeff Ward, K8KA is no longer the editor of Gateway. Instead, Jeff has decided to pursue a unique opportunity with the UoSat project in England. I know all of you appreciate the superb job Jeff has done editing Gateway, and will join me in wishing Jeff success with his new endeavor -- good luck Jeff.

As the new editor of Gateway, I will continue to report the latest news and developments taking place in the packet-radio community. Remember, much of the information contained in these pages comes from our readers. If Gateway is to continue to report the latest news that shapes packet-radio, it needs your input and support. If you have news that you would like to see included in Gateway, mail it to:

ARRL
Gateway Editor
225 Main St.
Newington, CT 06111

You may also send news electronically via CompuServe to ID: 72747,3207 or

via American People Link (PLINK) to ID: ED*WA2FTC. I hope you will continue to enjoy Gateway.

Ed Raso, WA2FTC

KENTUCKY PACKET ASSOCIATION

Several local radio clubs in Kentucky have joined together to form a state-wide packet organization. The state will be divided into several regions, with each region represented by its own chapter. The purpose of the organization is to coordinate packet activity and disseminate information throughout the state. The organization plans to publish its first quarterly newsletter later this month. For more information, contact:

Dan Hund, KB4CF
3444 Merrick Dr.
Lexington, KY 40502

From KE4NS

CALIFORNIA PACKET

On November 3, 1985, the silence on 145.05 Mhz in the southern half of California was broken with the installation of KB6C-1 on Frasier Peak (8000 ft). The site covers the greater L.A. area, San Diego to the south and Visalia to the north. KB6C-1, along with the existing site of WB6AIE-1 high in the Sierra Mountains, provides coverage from San Diego in the south to Modesto in the North. Plans are in the works to establish a site further north on 145.05 that will extend the coverage near the Oregon border. This system should give users an alternate path while providing the state with a three-hop network for use during times of emergency.

A mailbox is available in Fresno (middle of the network) operating under the call of WB6AIE. It is hoped that the central location of the mailbox will provide two-hop access to most users. This system is identical to the coastal 145.01 system operated by W6IXU. The 145.05 system runs north and south in the middle of the state, while the 145.01 system runs along the cost.

Comments or suggestions should be forwarded to Dennis, KB6C or Jerry, WB6AIE via the WB6AIE mailbox.

From WB6AIE

PACKET AND SET

On October 19, 1985, five north Texas stations participated in the Simulated Emergency Test (SET). Two local digipeaters, KC5LW-1 and N5EG, proved essential for passing traffic. The method of traffic handling was exclusively off-line message editing and preparation in accordance with

ARRL radiogram format. All messages were transmitted as files which reduced the transmit time per message to less then 15 seconds.

A test of the prototype PACGRAM software (Packet Status Register, March 1985) was conducted. One PACGRAM was successfully received at the Regional DPS office. This style of semi-automated message handling shows great promise for emergency service activities. Overall, we passed as much, or more traffic than the voice operators, and from a much larger area. Participating stations were: W0DRO, KB5F, WB5IZL, WB5QLD and WA5MWD.

From WA5MWD

KANTRONICS FIRMWARE UPDATE

Kantronics has released a new version of their TNC firmware. The update costs $10.00 and may be ordered by phone. New features include: 1) time and date stamping 2) calls heard list 3) trace command, and 4) path shown for repeaters.

Via HamNet

PTT MOD FOR TNC2 CORRECTION

W3IWI reports that the TNC2 PTT modification published in the Packet Status Register and CTM has one error. The last sentence of the last paragraph indicates that you can reverse the sense of the LED from bright=receive and dim=xmit by attaching the 1k resistor to pin-9 of U14 instead of pin-8...this is wrong.

The problem stems from the fact that U14 is used as part of the BBRAM logic and is powered from the battery when the power is off. If you reverse the sense, you will drive the battery current thru the LED and kill the battery. The modification (dim on xmit) works fine and doesn't drain the battery. When the power is off, pin-9 of U14 is low and no current flows thru the LED.

Via DRNET, W3IWI

SAREX II

The SAREX II packet-radio experiment to be carried aboard Shuttle flight STS-61E by Ron Parise, WA4SIR, has the potential for the greatest number of two-way contacts of any shuttle experiment to date. Operating in robot or monitor mode, the TNC has the capability of logging as many as ten calls every ten seconds. The sheer volume of packet-radio stations (10,000) by the March 1986 launch date precludes carrying any simple logging scheme on board. Instead, log beacons will be transmitted from the TNC on the downlink frequency for all stations to copy in real-time. Not only does this method give real-time feedback to public demonstration stations, but it also can be used to demonstrate the efficiency of the existing

terrestrial packet-radio network during post-flight data collection. By collecting all log packets received on the ground into a database, a complete log of all spacecraft packet activity can be constructed.

The purpose of this is to suggest an organized scheme and plan for the forwarding of all log data via Amateur packet-radio or other electronic mail into a central database. Because of the tremendous volume of reports and the regional similarity of most received reports, data reduction should be accomplished by regions and forwarded to a central point in a standard format.

Since most local area networks (LAN) are served by at least one W0RLI BBS, a first cut is to suggest that one station per BBS be designated to collect log reports from his LAN in message format. This station will accumulate individual messages into three Xerox 820 summary files: 1) a short file of all stations submitting a log report, 2) a file of all HEARD reports, and 3) a file of all WORKED reports. (One set of files per day of SAREX II packet operation). Each of these BBS files will be forwarded to a regional SAREX II coordinator to eliminate all redundant data and prepare a regional log. These logs will be submitted to Goddard ARC for final processing and assembly. For ease of processing, all logs submitted should be word processed by the originator into a specific format. An optimum solution would be to have the shuttle TNC time stamp each beacon. Using this method, only the exact beacon text string need be included in the collected data from individual stations. The standard format will simplify the data reduction algorithms significantly. These logs will be reduced into regional databases showing a maximum of ten HEARD times and five QSO numbers. Times will be in a six-digit serial UTC (HHMMSS) format. The QSO log is a four-digit hex number allowing as many as 65,000 unique assignments.

It is requested that regions select a single data reduction facility that has the capability of reducing data from the Xerox 820 message file format into IBM PC format for reduction using dBASE II. Regions can best be defined by arbitrary groupings of packet activity such as: SOUTHNET, EASTNET, GRAPES, MAPRC, NEPRA, CITS, etc. For more information, contact:

W3IWI
59 Southgate Ave.
Annapolis, MD 21401

Via DRNET

TNC2 UPDATE

A problem has cropped up on a very small number of TNC2 boards. The MF10 switched capacitor filter will latch-up to the positive +5 supply causing the regulator to become very hot. To cure the problem, change C10 on the -5V supply from 10uf to 47uf. If you experience any latch-up problems after changing C10, please notify TAPR immediately. Given our results, I strongly recommend all TNC2 owners institute this change.

From AD7I

NEW PACKET VENDOR

A new company, PacComm Packet Radio Systems, Inc., of Tampa, Florida has announced the availability of its TNC-200 Terminal Node Controllers for packet-radio applications. PacComm has been licensed by Tucson Amateur Packet Radio (TAPR) to produce packet controllers based on the TNC2 design.

The hardware design is the latest TAPR Revision 2 printed circuit board. The standard TNC-200 features 16 kbytes of RAM, 32 kbytes of EPROM, a CMOS Z-80 processor and a long-life lithium battery. The unit is packaged in the familiar extruded aluminum cabinet. The TNC-200 is available in standard low-power CMOS or optional NMOS.

PacComm Packet Radio Systems is owned by Andy Demartini KC2FF and Gwyn Reedy W1BEL both of whom are actively involved in FADCA, the Florida Amateur Digital Communications Association. Gwyn Reedy is currently editor of the FADCA>BEACON. For more information, contact:

PacComm Packet Radio Systems, Inc.
4040 W. Kennedy Blvd., Suite 620
Tampa, FL 33609

Via KC2FF

Packet Radio on the Move -- The Club Connection

(Fourth in a series by Steve Place, WB1EYI,
Manager, ARRL Volunteer Resources)

When we last left our hero, Pierre Packette, he was stuggling valiantly at the podium, flailing the air with a large club in a selfless attempt to save the townspeople from the evil clutches of Phil la Text . . . Ooops. Sorry. Hallucinating. At times, the bi-weekly serial approach to planning a club meeting gets a bit frustrating for me as well as for you. Thanks for bearing with me so far.

At this point in your fledgling packet-radio club's first meeting, you've made your guests feel welcome and have determined just what sort of critter has shown up -- and what sort of task you're faced with. If your gang did its pre-meeting promotional work well, you'll have a broad spectrum of technical sophistication and experience before you. What's the next step?

Packet Radio Overview and Tutorial

You should decide among yourselves what sort of overview is most appropriate based on your expertise and your audience's sophistication. A few battle-scarred techniques, tested under full combat conditions, however, will help you sustain a high level of interest.

* keep it light and keep it loose
* approach the introduction from the user's perspective and stay there
* don't get bogged down in technical detail
* impress them with the simplicity and ease of using packet radio, not with your technical prowess
* use very simple, clearly sketched depictions of what a packet "looks" like as well as diagrams of uncomplicated networks (well-chosen graphics can create breakthroughs in understanding)
* have all such visual aids (including chalkboard, chalk, eraser and handouts) ready before the meeting starts
* let them hear what a typical transmitted packet sounds like and gain a sense of the typical time delays in routing a packet through a number of stations
* leave the full-blown demonstration(s) for the next portion of the meeting

Be prepared to answer cheerfully the ubiquitous inaugural-packet-radio-club-meeting questions that are innocently and sincerely raised by people who should nonetheless know better:

* What equipment do I need? (answer at the "black-box" level)
* How much will it cost me to get a packet station on the air? (be honest; cover the options and tradeoffs briefly)
* Why bother with packet radio? I'm already using my computer on RTTY and CW.
* What will joining this club do for me? What's it cost?
* Who sells this stuff? How hard is it to build? Do I have to build it? Which brands are best?

Everyone has his own definition of what's best: the least expensive; the most reliable; the most compatible/adaptable; or the model sporting the flashiest chrome, brightest blinking lights, most awe-inspiring strap-yourself-in-for-blastoff console and the cutest little baby shoes hanging from the rearview mirror. Be honest. Talk from your own experience. And whatever you do, if you don't know the answer to a question, simply admit it, ask if any of the other club members can help and promise to get the answer for everyone by the next meeting. Honor that promise.

When you get right down to the bottom line (final amp in ham radio parlance?) the most effective tutorial overview of packet radio for a first meeting is the simple, informal chat aimed at covering what it's all about and why your guests should be interested. If you do it with a smile and pace your explanations to meet their needs, you'll give them a taste of the adventure, a desire to pursue their interest just a little further and a belief that your club is heaven's answer to their feelings of technical inadequacy. If I'm not mistaken, that sounds a little bit like the objectives you wanted to achieve!

But don't stop there. You've cast the net with your welcome and chummed the waters with your tutorial. No self-respecting packet-trawler Captain would hoist anchor and set sail for port without first hauling in his catch. Spark their interest with a hands-on demonstration; convince each guest with carefully-tailored special working groups that packet radio is

the solution to his particular problem; give each guest a reason to show up at the next meeting by assigning to each working group a small study on which they are to report back to the club; and then make each guest want to return by welcoming him into your club socially at a local bistro.

We'll help you chart a safe return course -- your main hold overflowing with a fresh catch of packeteers -- in the next installment.

From WB1EYI

NTS Needs Packet

Ed Eklund, K6XI, responding to "Does NTS have to stand for Naturally Troublesome System . . ." (in "Packet Radio and Warm Bodies," Gateway, October 1, 1985, Vol. 2, No. 4), writes --

> "Amateur Radio is a public service, 'particularly with respect to providing emergency communications.' That does not mean just being around to yell for help at chance encounters; it means organized preparedness.
>
> "We are unique among voluntary services in our potential for 'formal written' traffic but unfortunately NTS is slow, inaccurate, undependable and has insufficient capacity for emergency communications.
>
> "An increasingly sophisticated public is no longer awed by the performance of amateur radio. A major effort might show that amateur radio is indeed a public service and the biggest bang for the buck would be to vastly improve NTS, something that is now possible thanks to packet radio.
>
> "Nationwide packet radio system linking mailboxes serving present general participation nets could make NTS fast, accurate, dependable and have sufficient capacity for emergencies. ARRL Hq could plan a packet system, establish protocols and standards for equipment and do massive promotion.
>
> "Many veteran 'higher-echelon' operators would resent having their positions eliminated and they have the clout through area staffs. However, section net operators would like better service as it would greatly increase volume and interest, but unfortunately they, the main body of NTS, have no direct representation.
>
> "The public, if asked, would wonder what took us so long. After all, are we not said to be 'expert communicators on the cutting edge of technology?'
>
> From K6XI

REPRODUCTION OF GATEWAY MATERIAL

Material may be exerpted from Gateway without prior permission, provided
that the original contributor is credited and Gateway is identified as the
source.

From 2191257030021379778
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,223633e2ea6675e0
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-26 21:29:20 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!drutx!mtuxo!mtunh!ky2d-2!
ai2q
From: ai2q@ky2d-2.UUCP (Alex)
Newsgroups: net.ham-radio.packet
Subject: Re: Re: Circuit diagram of 9600 Baud modem?
Message-ID: <59@ky2d-2.UUCP>
Date: Wed, 27-Nov-85 00:29:20 EST
Article-I.D.: ky2d-2.59
Posted: Wed Nov 27 00:29:20 1985
Date-Received: Thu, 28-Nov-85 04:23:28 EST
References: <449@mit-eddie.UUCP> <55@ky2d-2.UUCP>
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 46

> > Hello!
> > Where can I get a circuit diagram of the 9600 Baud packet radio modem?
> > vy 73
> >   Karl-Heinz   DK8HI
>
> If you would like information about the K9NG 9600 baud modem,
> I would suggest you contact TAPR (Tuscon Amateur Packet Radio) at:
>
> Tuscon Amateur Packet Radio Club
> P.O. Box 22888
> Tuscon, Arizona 87534
>
> They should be able to tell you all you would like to know about
> Steve Goode's 9600 baud packet TNC.
>
> One other place to look for information on the modem is in the
> Gateway newsletter - Volume 2, Issue 2, September 4, 1985. There
> is an article around page 6 entitled, "K9NG MODEM PROJECT".
>
> The PC-board is supposed to be designed to connect a TNC and a
> Hamtronics FM-5 220 MHz transceiver. Other transceivers can be
> substituted, with appropriate modifications to the modem board.
>
> This will not be a step-by-step project for the beginning kitbuilder,
> but the documentation provided with the board and the article that
> Steve submitted to the proceedings of the fourth ARRL Amateur Radio

> Computer Networking conference (available for $10 from the ARRL)
> should allow experienced builders to assemble and test the modem.
>
> Hope that was helpful!
>
> -Tom Brown KA2UGQ

*** REPLACE THIS LINE WITH YOUR MESSAGE ***
-
.-3
$-3

Karl-Heinz:
You can find a detailed description of the 9600 bps modem in the Fourth ARRL Amateur Radio Computer Networking Conference proceedings, edited by Paul Rinaldo, W4RI, and Dr. Hank Magnuski, KA6M. A booklet is available from the ARRL as well as a bound volume conatining the previous three volumes of papers (also includes all the issues of Vol. I of GateWay, the ARRL Packet Radio Newsletter). The 7-page article begins on page 45.
---73 de Alex, AI2Q, Freeport, Long Island, New York

From 82322567253937283
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d7b1ce55fbd9d8e9,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,d7b1ce55fbd9d8e9,start
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1985-11-29 10:56:14 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!houxm!mtuxo!mtunh!ky2d-2!ka2ugq
From: ka2ugq@ky2d-2.UUCP (Tom)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: Re: packet interference with simplex communications
Message-ID: <62@ky2d-2.UUCP>
Date: Fri, 29-Nov-85 13:56:14 EST
Article-I.D.: ky2d-2.62
Posted: Fri Nov 29 13:56:14 1985
Date-Received: Tue, 3-Dec-85 07:56:44 EST
References: <60@ky2d-2.UUCP>
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 32
Xref: watmath net.ham-radio:3612 net.ham-radio.packet:160

> I would like to
> throw up the topic of the excessive use of transmitter power
> by many NY/NJ/CT area packeteers. It seems I am getting a
> lot of feedback from my simplex friends about packets messing
> up 145.000 and how we are supposed to be the super techs so why
> are we messing up so badly etc. etc.? My own personal opinion
> is that as usual, the few are causing problems for the many. Are you

> running 160W to access the local mailbox or your friend down
> the block? If so, wise up! Are you running the proper audio
> level into your TNC? You don't know? Get it checked!

I agree with you as far as packet users running more power than is needed to accomplish satisfactory communication. However, the fact that nearby packet stations are interfering with simplex users of frequencies near designated packet frequencies is different. As is the case with almost any new and powerful mode of communication that comes into being in Amateur Radio, packet has been assigned simplex frequencies that were previously used by amateurs for a club frequency or just simple chatting.

A while ago, our club (the New Providence Amateur Radio Club) had our base frequency on 145.800 MHz. As you may know, that frequency is now in use by the Oscar-10 and related satellites. We were forced to move just as the simplex users of the packet designated frequencies will have to move sooner or later.

> I am very impressed by the level of the commentary on this
> system. Please let's hear your views. Happy Thanksgiving!
> de Bob K2SK >>

Happy Thanksgiving to all (gobble-gobble)!
-Tom Brown KA2UGQ

From 3201593450226293660
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d7b1ce55fbd9d8e9
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,d7b1ce55fbd9d8e9
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1985-11-29 13:45:45 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!houxm!mtuxo!mtunh!ky2d-2!ai2q
From: ai2q@ky2d-2.UUCP (Alex)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: Re: Re: packet interference with simplex communications
Message-ID: <63@ky2d-2.UUCP>
Date: Fri, 29-Nov-85 16:45:45 EST
Article-I.D.: ky2d-2.63
Posted: Fri Nov 29 16:45:45 1985
Date-Received: Tue, 3-Dec-85 07:59:47 EST
References: <60@ky2d-2.UUCP> <62@ky2d-2.UUCP>
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 40
Xref: watmath net.ham-radio:3613 net.ham-radio.packet:161

> > I would like to
> > throw up the topic of the excessive use of transmitter power

> > by many NY/NJ/CT area packeteers. It seems I am getting a
> > lot of feedback from my simplex friends about packets messing
> > up 145.000 and how we are supposed to be the super techs so why
> > are we messing up so badly etc. etc.? My own personal opinion
> > is that as usual, the few are causing problems for the many. Are you
> > running 160W to access the local mailbox or your friend down
> > the block? If so, wise up! Are you running the proper audio
> > level into your TNC? You don't know? Get it checked!
>
> I agree with you as far as packet users running more power than is
> needed to accomplish satisfactory communication. However, the fact
> that nearby packet stations are interfering with simplex users of
> frequencies near designated packet frequencies is different. As is
> the case with almost any new and powerful mode of communication that
> comes into being in Amateur Radio, packet has been assigned simplex
> frequencies that were previously used by amateurs for a club
> frequency or just simple chatting.
>
> A while ago, our club (the New Providence Amateur Radio Club) had our
> base frequency on 145.800 MHz. As you may know, that frequency is now
> in use by the Oscar-10 and related satellites. We were forced to move
> just as the simplex users of the packet designated frequencies will
> have to move sooner or later.
>
> > I am very impressed by the level of the commentary on this
> > system. Please let's hear your views. Happy Thanksgiving!
> > de Bob K2SK >>
>
> Happy Thanksgiving to all (gobble-gobble)!
> -Tom Brown KA2UGQ

*** REPLACE THIS LINE WITH YOUR MESSAGE ***
One of the problems all packeteers are going to encounter is the lack
of publicity that has surrounded the coordinated packet channels. many
of the simplex phone ops I've spoken with have stated "I've never seen anything
in writing." Why not send a message to your SM or the League alerting them
aboutthis problem so we see more references to 145.01 through 145.09 in our pub-
lications?
73, Alex, AI2Q

From -7951583548759652572
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,39e47567ba62232c,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-04 11:43:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!drutx!mtuxo!mtunh!ky2d-2!k2sk
From: k2sk@ky2d-2.UUCP (Bob)
Newsgroups: net.ham-radio.packet
Subject: Re: Essay for the Digital Committee
Message-ID: <73@ky2d-2.UUCP>

Date: Wed, 4-Dec-85 14:43:00 EST
Article-I.D.: ky2d-2.73
Posted: Wed Dec 4 14:43:00 1985
Date-Received: Thu, 5-Dec-85 09:01:41 EST
References: <559@mit-eddie.UUCP>
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 182

> From: mills@dcn6.arpa
> Folks,
>
> There have been many informal discussions recently on the issue of
> "level-three" or "long-haul" protocols. The ARRL is planning meetings which
> will both create and solve problems in this areas. Phil Karn is trying to drum
> up support for these meetings in general and for IP/TCP in particular. Like
> some of the rest of us, Phil has learned a few lessons actually building and
> using high-flake networks that bear a strong resemblance to those likely to be
> built by the amateur community. On the other hand, there is a stong lobby,
> including mostly those who have built low-flake commercial networks and those
> who have built no networks at all, who display incandescant X.25/X.75/X.121
> bumper stickers.
>
> Personally, I think that conflict between the two lobbies is silly and that
> both communities can co-exist quite handily, as long as care is taken in the
> architecture. The best existence test might be the DARPA Internet, which
> includes X.25 nets, Ethernets and all kinds of others, even AX.25 nets, right
> now. However, I am worried that some zealot might cop off something silly at
> one of these meetings and that may result in shutting down some very useful
> options.
>
> Accordingly, I herewith break my promise to confine mutterings to my own swamp
> and offer the following essay. You should understand the opinions are
> definitely my own and that the exposition is intentionally tart. My hope is to
> get you all mad in the first five minutes after reading it, assuming you
> survive that trip. Please do not compose a reply during that interval. Then,
> I hope that you will think through the issues and direct buttals and rebuttals
> not at me, but at the members of the ARRL Digital Committee.
>
> On the Standards Process
>
> Research tends to expand the number of options, while standards tends to
> decrease them. One should push on either one until the rate of increase equals
> the rate of decrease and so that the total number results in a healthy and
> vigorous community.
>
> Amateur radio is after all a recreational community, a fact which some of our
> more agressive special-interest groups sometimes forget. As technology matures
> standards often work to encourage new entrants and to stabilize exploitation,
> with the amateur satellite community being a good example. Pre-emptive efforts
> to standardize, especially in a recreational community, would work to
> discourage innovation, enthusiasm and participation in the standards process
> itself. Volunteer standards (e.g. bandplans) work only if there is a clearly
> defined benefit which extends beyond the boundaries of the special-interest

> group. In other words, resist telling someone what's good for him unless he
> asks.
>
> Any standards process that does not represent the consensus of a constituent
> majority or is opposed by a significant minority who may be bound by it will
> be unpopular, discredited or ignored, regardless of technical merit. Any
> standards process that attempts to restrict the scope of design,
> implementation and experiment must be thoroughly justified on engineering
> grounds. Political justifications are unacceptable. The notion that our
> community can't do something because the Europeans (or the Martians for that
> matter) won't accept it is too preposterous for comment.
>
> Every standard has a definite life cycle from the point at which a need for it
> is identified, through the coordination and specification process, prototype
> implementation and testing, then a period of refinement and evolution until
> finally it is overtaken by a successor. A standard must never attempt to
> stifle the evolution of successors; in fact, it must encourage it. One of the
> implications is that every packet header must include a protocol identifier
> and version number, so that different protocols and versions can co-exist in
> the same system.
>
> Any network-level standards proposed for use in the amateur packet-radio
> community must address the issue of the radio channel a-priori. An "amateur"
> standard requiring, for instance, use of X.25 or SLIP on wire links between
> local-area gateways, is completely out of scope. Such would not be an amateur
> packet-radio standard, merely a bilateral agreement between the gateway
> operators. The amateur community is best served by concentrating on the
> engineering problems and their solutions with respect to radio issues and only
> secondarily on the more well-studied non-radio issues. The Manufacturing
> Automation Protocol suite is a good example of how to resist the urge to
> reinvent the wheel.
>
> General Assumptions
>
> While the existing CSMA/FM technology has little going for it on pragmatic
> engineering grounds, its widespread use is a fact. The AX.25 frame-level
> procedures are certainly useful, but badly matched to the CSMA/FM channel
> characteristics. Much can be done to improve operational procedures to reduce
> congestion and improve throughput, including the use of multiple channels and
> cross-channel bridges. However, development of the long-haul system must not
> presuppose such improvements.
>
> The existing organization can be described as a datagram network with
> stateless repeaters and reliablity provided by end-end resequencing and
> retransmission. It may happen that some long-haul systems will include
> internal provisions for resequencing and retransmission in order to improve
> performance. However, such provisions must not obsolete existing end systems
> and protocols. Specifically, this requires an overall system specification on
> maximum permissable delay.
>
> Datagram routing between end systems is presently determined by an explicit
> indication of source route in every frame. Pragmatically, this can be
> justified by the fact it works reasonably well in local-area systems where

> there are limited choices of available routes and the number of hops is small.
> It may happen that sophisticated routing algorithms will be developed for use
> in some local areas; however, a long-haul system must not presuppose this.
>
> Development of the long-haul system must not depend upon a particular choice
> in addressing or routing semantics used in a local area and must not require
> changes in existing local-area procedures when working other stations in the
> local area. This implies the long-haul system must be able to interconnect
> existing Vancouver and AX.25 communities and possibly others that may come
> along, even if they share the same radio channel.
>
> On Datagrams vs Virtual Circuits
>
> Experience in the education, research and development community suggests the
> use of an internetworking protocol and addressing paradigm based on either the
> DARPA or ISO connectionless protocol suites. In this model end-end
> connectionless (datagram) service is the primary communication mechanism, with
> reliability achieved through the use of end-end internet virtual circuits,
> perhaps supplemented by intranet virtual circuits. Gateways between
> connectionless networks are stateless and operate only in datagram mode, so
> are relatively simple.
>
> Experience in the common-carrier community suggests the use of an
> internetworking protocol based on the X.75/X.121 protocol suite. In this model
> connection (virtual-circuit) service is the primary communication mechanism,
> with reliability achieved through the use of concatenated virtual circuits
> between the gateways. Gateways between connection networks must preserve state
> for each individual end-end virtual circuit, so are relatively complex.
>
> Given the present flux in design philosophy and opinion, it is inappropriate
> for the views of either community to dominate the standards process. The
> standardization, design and implementation of long-haul amateur packet-radio
> systems should not preclude access from either communty to the other, perhaps
> via strategically located protocol-translation gateways. Furthermore, the
> basic long-haul transport mechanism must provide for both connectionless and
> connection service on an end-end basis. Many examples of how to do this are
> apparent in the DARPA Internet system.
>
> On Interoperability
>
> There are now and will be in the future numerous opportunities to proliferate
> access to and between amateur packet-radio systems via public and private nets
> including, but not limited to, the DARPA Internet, VAN nets (Telenet, etc.),
> BITNET, USENET, MAILNET, CSNET and others. In many cases the access must by
> controlled on economic or policy grounds. This is a very tricky issue in view
> of the individual policies of these nets and the government regulations under
> which the Amateur Service operates. In fact, the duly approved use of one or
> another of these nets or even ordinary dial-up modem connections may be a
> useful alternative to a strictly Amateur-Service backbone trunk in some cases.
>
> The most important factor in these issues may be the need for survivability
> and interoperability in case of civil emergency or disaster communications.
> The standards process must consider these implications with respect to

> interconnecting to other link technologies, for instance, an HF link as backup
> for a 220-MHz multiple-hop backbone or an XMODEM or KERMIT dial-up link as a
> bridge between mail forwarders.
>
> Note very carefully that these factors must not be allowed to advance the
> cause of any particular protocol, such as X.25, Internet or XMODEM, without
> considering the entire protocol suite of which this protocol might be a
> component. It makes no sense to blindly speak X.25 on the basis that
> "everybody does it" without considering what applications above X.25 that the
> emergency-communications community will need and have available.
>
> Dave
> -------

Dave and all other high level planners -

Fellas its like this: You are 6 months to a year behind
schedule on long haul high speed "backbone" systems. It will
take several years to get them all up and running. If you
start now, it will be too late to prevent the furious mess
that will occur when all those TNC2 clones are unwrapped on
channukah and christmas mornings! The sad result of that will
be that many will give up on packet as being "too slow" and
"too unreliable" "no good for dx" etc. The flea mkts. will
be flooded with TNCs and we will never be seen again!
I have a message for all of you:
While I enjoy reading these essays and arguements (some of
which are so steeped in jargon I can barely follow them),
they AREN'T GETTING THE NETWORKS BUILT!! We don't need it
PERFECT fellas, we need it TUESDAY!   - Bob   >>

From -382651574607579631
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,39e47567ba62232c
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-05 10:59:10 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!harvard!talcott!panda!genrad!decvax!
bellcore!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Re: Essay for the Digital Committee
Message-ID: <711@petrus.UUCP>
Date: Thu, 5-Dec-85 13:59:10 EST
Article-I.D.: petrus.711
Posted: Thu Dec 5 13:59:10 1985
Date-Received: Sat, 7-Dec-85 17:03:11 EST
References: <559@mit-eddie.UUCP> <73@ky2d-2.UUCP>
Organization: Bell Communications Research, Inc
Lines: 40

> Dave and all other high level planners -
>
> Fellas its like this: You are 6 months to a year behind
> schedule on long haul high speed "backbone" systems. It will
> take several years to get them all up and running. If you
> start now, it will be too late to prevent the furious mess
> that will occur when all those TNC2 clones are unwrapped on
> channukah and christmas mornings! The sad result of that will
> be that many will give up on packet as being "too slow" and
> "too unreliable" "no good for dx" etc. The flea mkts. will
> be flooded with TNCs and we will never be seen again!
> I have a message for all of you:
> While I enjoy reading these essays and arguements (some of
> which are so steeped in jargon I can barely follow them),
> they AREN'T GETTING THE NETWORKS BUILT!! We don't need it
> PERFECT fellas, we need it TUESDAY!   - Bob   >>

Lots of things ARE going on in the way of packet development. I am working on a portable TCP implementation in C which is undergoing debugging at the moment. I also plan on bringing up the BRL Gateway or something similar on a small cheap machine like the 820 or any of the various networking controllers now under development. I have already written an AX.25 implementation for the 820 that will serve as the foundation for the gateway.

Note that my last three sentences began with "I". That's because, to my knowledge, I'm the only person doing all this work. Since you agree that work needs to be done, how about taking your hands out of your pockets and helping out instead of just griping? There's no money in this business, and there's other things I have to do to earn a living, so there's plenty of ways you could help.

Remember, folks, this is a hobby, and it's also supposed to be an EDUCATIONAL one. If all you want is reliable communications without bothering with the gritty details, go buy it from AT&T or GTE or any other common carrier and pay for the privilege. I'd like to learn something along the way, and I like to think that SOME other hams feel the same way.

73,
Phil

From 1492559562381927329
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,b24139ea54d9a064,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-06 07:55:42 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.3 4.3bsd-beta 6/6/85; site seismo.CSS.GOV
Path: utzoo!linus!gatech!ut-sally!seismo!mo
From: mo@seismo.CSS.GOV (Mike O'Dell)
Newsgroups: net.ham-radio.packet

Subject: Building backbones
Message-ID: <983@seismo.CSS.GOV>
Date: Fri, 6-Dec-85 10:55:42 EST
Article-I.D.: seismo.983
Posted: Fri Dec 6 10:55:42 1985
Date-Received: Sat, 7-Dec-85 17:25:42 EST
Organization: Center for Seismic Studies, Arlington, VA
Lines: 29

For the person complaining about wanting backbones yesterday so damn
the engineering, as a person working on a possible backbone switch,
I can tell him that many of the existing problems stem from not
doing the necessary engineering and simply wishing at the problems.
The currently-used protocols were never designed to be used over
multi-access media and work correspondingly well. There are things that
can be done to the protocols to improve their behavior, and that is
being looked at. Another very fruitful approach would be to use
full-duplex RF repeaters, instead of simplex digipeaters, but everyone
says that is technically difficult and economically impossible.
It is more likely challenging in both areas, ignoring the geopolitics
of voice versus data bias in band plans and "coordination committees."

I must also mention the Phil Karns and Terry Foxes and the other
people who are trying to do the real work. The number
of people working is small; the problems are very difficult, given the
irrational shape of the feasible solution space; and perfection certainly
isn't the goal - but simply spraying bits around and claiming "gee,
look what I can do with my new TNC and my 2m HT", and calling it
"packet radio" while utterly ingoring the engineering issues is not
worthy of the enterprise which has done other fine work like transforming
SSB from mathematics on the blackboard into an operational reality.

A great deal is known about the problems which must be solved,
and try as we might, the laws of physics are not subject to supplication,
at least in my neck of the woods.

     -Mike O'Dell
     (learning the bloody code in spite of his better judgement)

From -7230568379693397780
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,39e47567ba62232c
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-07 19:03:08 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!decvax!genrad!mit-eddie!@DCN6.ARPA:mills@dcn6.arpa
From: @DCN6.ARPA:mills@dcn6.arpa
Newsgroups: net.ham-radio.packet
Subject: Re: Essay for the Digital Committee
Message-ID: <663@mit-eddie.UUCP>
Date: Sat, 7-Dec-85 22:03:08 EST

Article-I.D.: mit-eddi.663
Posted: Sat Dec 7 22:03:08 1985
Date-Received: Wed, 11-Dec-85 08:45:17 EST
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 21

From: mills@dcn6.arpa
Bob,

Your enthusiasm is wonderful, your impatience understandable and even
your irritation tolerable. Those of us who have built or used networks
professionally understand that it is easy to sling wires but extraordinarily
hard to build large networks that are always there when you wnat them,
adapt handily to changing traffic and know where everybody is, even if
they are trotting around the expressways.

I have a fabulous suggestion. While some of us are fumbling around trying
to build the network of your dreams, why not use the telephone system? Or
better yet, linked (audio) repeaters? I'm entirely serious. You and others
who want simply to hook widely separated digipeaters together and ragchew
with your friends could form an appropriate committee and work out how
to do that using telephones and linked repeaters. Meanwhile some of the
rest of us can have a wonderful time figuring out how to do that with
packet switching. Not necessarily better, but certainly different.

Dave

From 6016944787111985680
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e6f79bf56ec2bb7b,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-10 21:55:36 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxt!houxm!vax135!cornell!uw-beaver!
tektronix!hplabs!intelca!qantel!lll-crg!ucdavis!ucbvax!decvax!bellcore!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: TCP Programmers Guide
Message-ID: <751@petrus.UUCP>
Date: Wed, 11-Dec-85 00:55:36 EST
Article-I.D.: petrus.751
Posted: Wed Dec 11 00:55:36 1985
Date-Received: Wed, 18-Dec-85 05:52:42 EST
Organization: Bell Communications Research, Inc
Lines: 186

My work on a TCP implementation for amateur packet radio has reached the
point where I can describe the interface provided to the application by TCP.
I have also written a UDP (User Datagram Protocol); however, this is

not at the same level of maturity as TCP and is therefore more subject
to change. This note is meant primarily as "advance information" to
any implementers considering writing applications.

To review the purpose of TCP: it supports a reliable, sequenced, byte
stream "connection" on an end-to-end basis. It fits in roughly at the
Transport layer (level 4) of the OSI model. Since a single TCP module
supports multiple connections through the use of port numbers, it also
provides Session layer (level 5) functionality without the need for a
distinct protocol. (Or it makes the session layer unnecessary, depending
on your point of view). This package is written as a "module" intended to
be compiled and linked with the application(s) so that they can be run as one
program on the same machine. This greatly simplifies the user/TCP interface,
since it becomes just a set of internal subroutine calls on a single
machine. Reliability is much greater, since a hardware failure that
kills TCP will likely take any applications with it anyway. Only IP datagrams
flow out of the machine across hardware interfaces (such as asynch RS-232
ports or whatever else is available) so hardware flow control or complicated
host/front-end protocols are unnecessary.

A TCP connection is uniquely specified by the concatenation of source
and destination "sockets". In turn, a socket is the concatenation of a
host address (a 32-bit integer) and a TCP port (a 16-bit integer), defined
by the C structure

```
struct socket {
long address;/* 32-bit IP address */
short port;/* 16-bit TCP port */
};
```

Therefore it is possible to have several distinct connections established
at the same time to a single port on a given machine, as long as the
source sockets are distinct. Port numbers are used either through mutual
agreement, or more commonly when a "standard" service is involved, a "well
known port" number. For example, to obtain standard remote login service
(known as "telnet") one initiates a connection to TCP port 23; to send mail
using the Simple Mail Transfer Protocol (SMTP) one talks to port 25.
ARPA maintains port number lists and periodically publishes them. They will
also assign port numbers to a new application on request if it appears to be
of general interest.

TCP connections are best modeled as a pair of one-way paths (one in each
direction) rather than as a single full-duplex path. Station A may close
its path to station B leaving the reverse path from B to A unaffected.
B may continue to send data to A indefinitely until it too closes
its half of the connection. This is known as "graceful close" and can
greatly simplify an application.

My TCP code supports five basic operations on a connection: open, send,
receive, close and delete. A sixth, tcp_state(), is provided mainly for
debugging. They are summarized in the following section in the form of C
declarations and descriptions of each argument.

```
int net_error;
```

This global variable is used to indicate the specific cause of an error in one of the TCP or UDP functions. All functions returning integers (i.e., all except open_tcp) return -1 in the event of an error, and net_error should be examined to determine the cause. The possible errors are defined as constants in a header file.

```
/* Open a TCP connection */
struct tcb *
open_tcp(lsocket,fsocket,active,notify,tos)
struct socket *lsocket,*fsocket;
int active;
void (*notify)();
char tos;
```

"lsocket" and "fsocket" are pointers to the local and foreign sockets, respectively.

"active" is 0 for a "passive" open (one in the TCP LISTEN state). A passive open does not cause any packets to be sent, but enables TCP to accept a subsequent active open from another TCP. If a specific foreign socket is passed to a passive open, then connect requests from all other foreign sockets will be rejected. If the foreign socket fields are set to zero, then connect requests from any foreign socket will be accepted. If "active" is 1, TCP will initiate a connection to a remote socket that must previously have been created in the LISTEN state. The foreign socket must be completely specified in an active open.

"notify" is an optional receive "upcall" mechanism, useful when running in a non operating system environment. If "notify" is non-zero, it is taken as the address of a function to be called whenever a "significant" amount of data arrives. This user-provided function may then invoke recv_tcp() to obtain the incoming data.

"tos" is the Internet "type of service" field, consisting of precedence and class of service parameters. There are 8 levels of precedence, with the bottom 6 defined by the military as Routine, Priority, Immediate, Flash, Flash Override and CRITICAL. (Two more are available for internal network functions). For amateur use we can use the lower four as Routine, Welfare, Priority and Emergency. Three more bits specify class of service, indicating that especially high reliability, high throughput or low delay is needed for this connection. The entire TOS field is passed along to IP in each datagram and is interpreted by each IP gateway (packet switch) in the route. The precedence value actually used is the higher of those specified in the two tcp_open() calls.

open_tcp() returns a pointer to an internal Transmission Control Block ("tcb"). This "magic cookie" must be passed back as the first argument to all other TCP calls. In event of error, the NULL pointer (0) is returned.

The only limit on the number of TCBs that may exist at any time (i.e., the number of simultaneous connections) is the amount of free memory on the

machine. Each TCB on a 16-bit processor takes up about 129 bytes; additional memory is consumed and freed dynamically as needed to buffer send and receive data. Deleting a TCB (see the delete_tcb() call) reclaims its space.

```
/* Send data on a TCP connection */
int
send_tcp(tcb,data,cnt)
struct tcb *tcb;
char *data;
unsigned cnt;
```

"tcb" is the pointer returned by the open_tcp() call. "data" points to the user's buffer, and "cnt" specifies how long it is. The number of bytes actually queued for transmission is returned; it will equal "cnt" unless some sort of error occurs, such as lack of memory for buffering.
The data is copied into an internal queue, a transmission is attempted, and the function returns so that the user may immediately reuse his buffer. TCP uses positive acknowledgments and retransmission to ensure in-order delivery, but this is largely invisible to the user. TCP enforces no limit on how much data can be queued for transmission, so the user should be careful not to run the system out of free memory. (This is something else that requires a multitasking kernel to do right).

```
/* Receive data on a TCP connection */
int
recv_tcp(tcb,data,cnt)
struct tcb *tcb;
char *data;
unsigned cnt;
```

The arguments to recv_tcp() are identical to those of send_tcp(), except that any data on the connection's receive queue is placed in the user's buffer, up to a maximum of "cnt" bytes. The actual number of bytes received (the lesser of "cnt" and the number pending on the receive queue) is returned. Since this TCP module cannot assume the presence of sleep/wakeup primitives provided by an underlying operating system, recv_tcp() is currently designed to return -1 with net_error set to EWOULDBLK if no incoming data is pending. The "notify" feature on open_tcp() is provided to eliminate the need for constant polling of the recv_tcp() function; whenever TCP calls the notify function, it guarantees that recv_tcp() will not return -1. (Technical note: "notify" is called whenever a PUSH or FIN bit is seen in an incoming segment, or if the receive window fills. It is also called before an ACK is sent back to the remote TCP, in order to give the user an opportunity to piggyback any data in response.)

When the remote TCP closes its half of the connection and all prior incoming data has been read by the local user, subsequent calls to recv_tcp() return 0 rather than -1 as an "end of transmission" indicator.

```
/* Close a TCP connection */
close_tcp(tcb)
struct tcb *tcb;
```

This tells TCP that the local user has no more data to send. However, the
remote TCP may continue to send data indefinitely to the local user,
until the remote user also does a close_tcp(). An attempt to send data
after a close_tcp() is an error.

```
/* Delete a TCP connection */
delete_tcp(tcb)
struct tcb *tcb;
```

When the connection has been closed in both connections and all incoming
data has been read, this call is made to cause TCP to reclaim the space
taken up by the TCP control block. Any unread incoming data is lost.

```
/* Dump a TCP connection state */
tcp_state(tcb)
struct tcb *tcb;
```

This debugging call prints an ASCII-formatted dump of the TCP connection
state on the terminal. You need a copy of the TCP specification (ARPA
RFC 793 or MIL-STD-1778) to interpret most of the numbers.

Well, that's it. Constructive comments on this interface are welcomed.

73, Phil Karn, KA9Q

From 3861216260092173120
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,82310ca58e3480a8,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-11 05:15:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version nyu B notes v1.5 12/10/84; site rocksvax.FUN
Path: utzoo!watmath!clyde!burl!ulysses!allegra!princeton!rocksvax!drdave
From: drdave@rocksvax.FUN (Dave Birnbaum)
Newsgroups: net.ham-radio.packet
Subject: Problem with 'DED PROMs??
Message-ID: <1130001@rocksvax.FUN>
Date: Wed, 11-Dec-85 08:15:00 EST
Article-I.D.: rocksvax.1130001
Posted: Wed Dec 11 08:15:00 1985
Date-Received: Thu, 12-Dec-85 06:36:40 EST
Organization: Xerox, Henrietta
Lines: 7

Has anyone found a problem with the WA8DED PROMs for the TAPR1
TNC? I cannot connect ot several of the local repeaters which
have "names" (like ATTICA or NIAGAR) instead of call signs. The
TNC gives me a *ILLEGAL COMMAND* message.

Thanks
Dave, K2LYV

From 5833362753710139783
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5171312f60256308,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-11 09:45:20 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site nbc1.UUCP
Path: utzoo!watmath!clyde!cbosgd!ukma!psuvm.bitnet!psuvax1!burdvax!sdcrdcf!
sdcsvax!dcdwest!ittatc!decvax!genrad!panda!talcott!harvard!cmcl2!philabs!nbc1!abs
From: abs@nbc1.UUCP (Andrew Siegel)
Newsgroups: net.ham-radio.packet
Subject: Packet radio for Macintosh?
Message-ID: <135@nbc1.UUCP>
Date: Wed, 11-Dec-85 12:45:20 EST
Article-I.D.: nbc1.135
Posted: Wed Dec 11 12:45:20 1985
Date-Received: Sat, 14-Dec-85 04:03:12 EST
Organization: NBC Computer Imaging, New York, NY
Lines: 6

Does anyone know about software/hardware under development to allow
owners of Apple Macintoshes to use their computers as TNC's?

Andrew Siegel, N2CN
NBC Computer Imaging
philabs!nbc1!abs

From -7670748733741611168
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,79a694571d3a9274,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-12 06:50:34 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!cbosgd!ukma!psuvm.bitnet!psuvax1!burdvax!sdcrdcf!ucla-
cs!ucbvax!decvax!genrad!mit-eddie!bcn
From: bcn@mit-eddie.UUCP
Newsgroups: net.ham-radio.packet
Subject: NE-MAP.018
Message-ID: <719@mit-eddie.UUCP>
Date: Thu, 12-Dec-85 09:50:34 EST
Article-I.D.: mit-eddi.719
Posted: Thu Dec 12 09:50:34 1985
Date-Received: Sat, 14-Dec-85 23:28:10 EST
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 5

From: bcn (Clifford Neuman)
Does anyone out there have an online copy of NE-MAP.019 that they
can send me. Thanks,

~ Cliff

From -3741560790301747201
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e6f79bf56ec2bb7b
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-12 13:47:27 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site amdimage.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxt!houxm!vax135!cornell!uw-beaver!
tektronix!zehntel!dual!vecpyr!amd!amdcad!amdimage!cmoore
From: cmoore@amdimage.UUCP (chris moore)
Newsgroups: net.ham-radio.packet
Subject: Re: TCP Programmers Guide
Message-ID: <823@amdimage.UUCP>
Date: Thu, 12-Dec-85 16:47:27 EST
Article-I.D.: amdimage.823
Posted: Thu Dec 12 16:47:27 1985
Date-Received: Thu, 19-Dec-85 03:40:26 EST
References: <751@petrus.UUCP>
Reply-To: cmoore@amdimage.UUCP (chris moore)
Organization: AMDIMAGE, Sunnyvale, CA
Lines: 32

In article <751@petrus.UUCP> karn@petrus.UUCP (Phil R. Karn) writes:
>
>Therefore it is possible to have several distinct connections established
>at the same time to a single port on a given machine, as long as the
>source sockets are distinct. Port numbers are used either through mutual
>agreement, or more commonly when a "standard" service is involved, a "well
>known port" number. For example, to obtain standard remote login service
>(known as "telnet") one initiates a connection to TCP port 23; to send mail
>using the Simple Mail Transfer Protocol (SMTP) one talks to port 25.
>ARPA maintains port number lists and periodically publishes them. They will
>also assign port numbers to a new application on request if it appears to be
>of general interest.
>

This is the one part that bothers me, although maybe my fears are
unjustified. If I want to use the network, I have to have a socket
address assigned to me. Who will handle this? Will I have to
wait weeks for somebody to assign a socket address? Is there a
chance that "they" will decide that it's not in the "general interest"
to give me a port number?

Maybe I missed the whole point here, and if so, could someone please
clarify this? Thanks muchly.
Chris Moore

--

Of course we have backup tapes. Do you want last year or the
 year before?

 Chris Moore (408) 749-4692
 UUCP: {ucbvax,decwrl,ihnp4,allegra}!amdcad!amdimage!cmoore

From 424861600390643403
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,82310ca58e3480a8
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-12 13:47:34 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!cbosgd!ukma!psuvm.bitnet!psuvax1!burdvax!sdcrdcf!ucla-
cs!ucbvax!decvax!genrad!mit-eddie!@DCN6.ARPA:mills@dcn6.arpa
From: @DCN6.ARPA:mills@dcn6.arpa
Newsgroups: net.ham-radio.packet
Subject: Re: Problem with 'DED PROMs??
Message-ID: <723@mit-eddie.UUCP>
Date: Thu, 12-Dec-85 16:47:34 EST
Article-I.D.: mit-eddi.723
Posted: Thu Dec 12 16:47:34 1985
Date-Received: Sat, 14-Dec-85 23:16:52 EST
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 7

From: mills@dcn6.arpa
Dave,

The firmware checks all addresses for legal callsigns. You lose.

Dave

From 5955927355769591532
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e15bee6d04c7a425,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-12 19:47:34 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxt!houxm!vax135!cornell!uw-beaver!
tektronix!hplabs!intelca!qantel!dual!lll-lcc!lll-crg!seismo!cmcl2!harvard!think!
mit-eddie!clements@bbnccq
From: clements@bbnccq
Newsgroups: net.ham-radio.packet
Subject: Non-callsigns as addresses
Message-ID: <727@mit-eddie.UUCP>
Date: Thu, 12-Dec-85 22:47:34 EST
Article-I.D.: mit-eddi.727

Posted: Thu Dec 12 22:47:34 1985
Date-Received: Thu, 19-Dec-85 04:03:41 EST
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 32

From: Bob Clements <clements@bbnccq.ARPA>
Dave, K2LYV, asked about connecting to stations with non-callsigns as their addresses, while using the WA8DED TNC-1 code.

Well, there has been serious abuse of the address field in parts of the country. Stations signing "GOD" and "PIZZA" and other strange things have been seen.

We are using a new mode which the FCC regulations just don't cover very well. Lots of what we do is simply illegal under the rules, like beaconing on frequencies that are not allowed for beacons, and beaconing for purposes other than what the rules say a beacon is. What we are doing is "broadcasting", and it's illegal.

My point is that the FCC is consciously letting us experiment because experimenting is a good thing. They haven't dumped on us yet because we are mostly trying to do good things.

I can't believe that using the address field of an AX.25 frame for something other than a callsign is a "good thing". It's the one common point which tells anyone who is responsible for the transmission, regardless of what else we may pack into the frame. Sure, maybe the "ATTICA" station is beaconing (broadcasting) with a real callsign. I don't know, since I am not in that area. But I would vote against this practice.

Having said all that, and though I don't recommend doing it, I will reveal the following secret datum: If you put a zero in the byte at C025 hex in the V1.0 WA8DED code, it will NOT check for valid callsigns. But think about the issues involved before you do it, please.

73,
Bob, K1BC

From 1740011670533506217
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e6f79bf56ec2bb7b
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-13 19:40:07 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!watmath!clyde!cbosgd!ukma!psuvm.bitnet!psuvax1!burdvax!sdcrdcf!ucla-cs!ucbvax!decvax!bellcore!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Re: TCP Programmers Guide
Message-ID: <756@petrus.UUCP>

Date: Fri, 13-Dec-85 22:40:07 EST
Article-I.D.: petrus.756
Posted: Fri Dec 13 22:40:07 1985
Date-Received: Thu, 19-Dec-85 04:17:56 EST
References: <751@petrus.UUCP> <823@amdimage.UUCP>
Organization: Bell Communications Research, Inc
Lines: 30

Relax. "Well known port numbers" are needed only for SERVICE TYPES that are likely to become widespread on the Internet. When establishing a connection as a client, you simply pick a port number that is unused on your machine (convention holds that you use one between 1000-65535). If you want to experiment with a new service, you are free to pick a number at random for testing, and no one could care less.

The reason there are "well known port numbers" and a procedure for registering them is to simplify matters should your service become widespread on the network. Using a standard port number allows you to avoid having the same service appearing on a different port number on each machine on the Internet. For example, if I want a login prompt from ucbvax over the Internet, I initiate a TCP connection to ucbvax port 23, because 23 is the "well-known port number" for the Telnet (remote login) service. I use the same number with any other machine on the net should I want a login prompt from it; I don't need a database per machine to tell me where to find each service.

The only situation where we might want a formal port number assignment would be if we want to set up a new service which is likely to become widespread. For example, someone might want to put a UNIX system up on the air with a server process that provides a W0RLI-style PBBS and make it available to people without forcing them to go through the normal UNIX-style login procedure. I could establish and register a well-known port number for "W0RLI PBBS Service", so that any other systems that offer the same service could use a the same, standard number. You connect to this special port and you get the bulletin board; you want to login to "real" UNIX, you connect to port 23. It's just an operational convenience, that's all.

Phil

From 8546401723603786797
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e15bee6d04c7a425
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-13 19:51:41 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!watmath!clyde!cbosgd!ukma!psuvm.bitnet!psuvax1!burdvax!sdcrdcf!ucla-cs!ucbvax!decvax!bellcore!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Re: Non-callsigns as addresses
Message-ID: <757@petrus.UUCP>

Date: Fri, 13-Dec-85 22:51:41 EST
Article-I.D.: petrus.757
Posted: Fri Dec 13 22:51:41 1985
Date-Received: Thu, 19-Dec-85 04:18:34 EST
References: <727@mit-eddie.UUCP>
Organization: Bell Communications Research, Inc
Lines: 13

I'm not particularly worried about the legality of this, because something
that is technically "broadcasting" is okay if its purpose is to facilitate
the process of two-way communication. For example, it'll be hard to do
automatic routing some day if prohibitions on "broadcasting" are interpreted
very strictly. As long as you ID in some standard fashion, I don't see any
legal reason why you can't put non-callsigns in AX.25 address fields.

Not to say that you SHOULD do this, however. I AM bothered by the tendency
of the average packeteer to come up with quick and clever hacks that'll
just come back to bite us later when we try to provide the same functions in
a cleaner fashion.

Phil

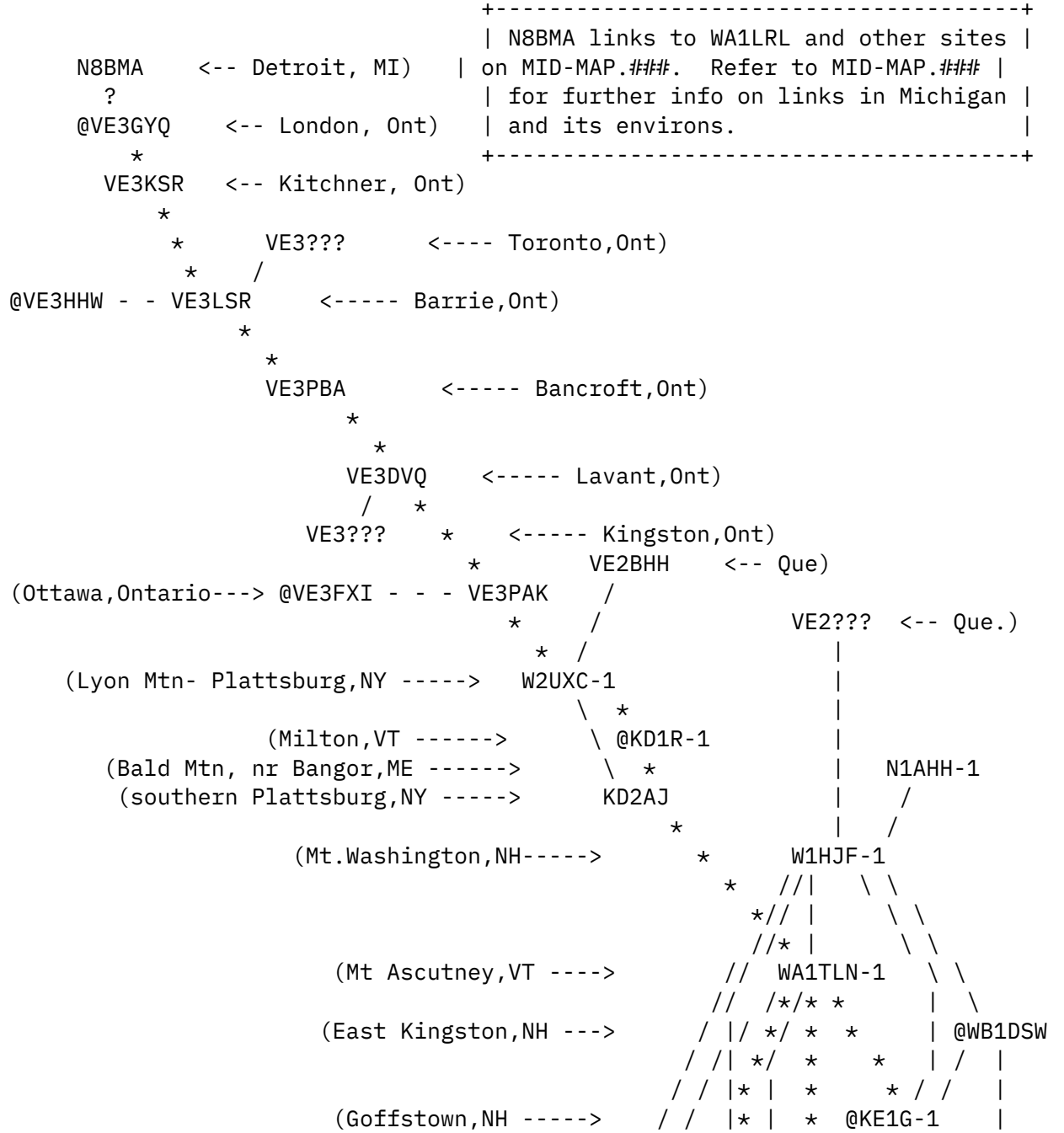
From 1808853411268894717
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,45baac5b21dbf83d,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-15 05:22:14 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!bellcore!
decvax!mcnc!philabs!cmcl2!harvard!think!mit-eddie!bcn
From: bcn@mit-eddie.UUCP (Clifford Neuman)
Newsgroups: net.ham-radio.packet
Subject: NE-MAP.019
Message-ID: <753@mit-eddie.UUCP>
Date: Sun, 15-Dec-85 08:22:14 EST
Article-I.D.: mit-eddi.753
Posted: Sun Dec 15 08:22:14 1985
Date-Received: Wed, 18-Dec-85 04:39:26 EST
Organization: MIT, Cambridge, MA
Lines: 127

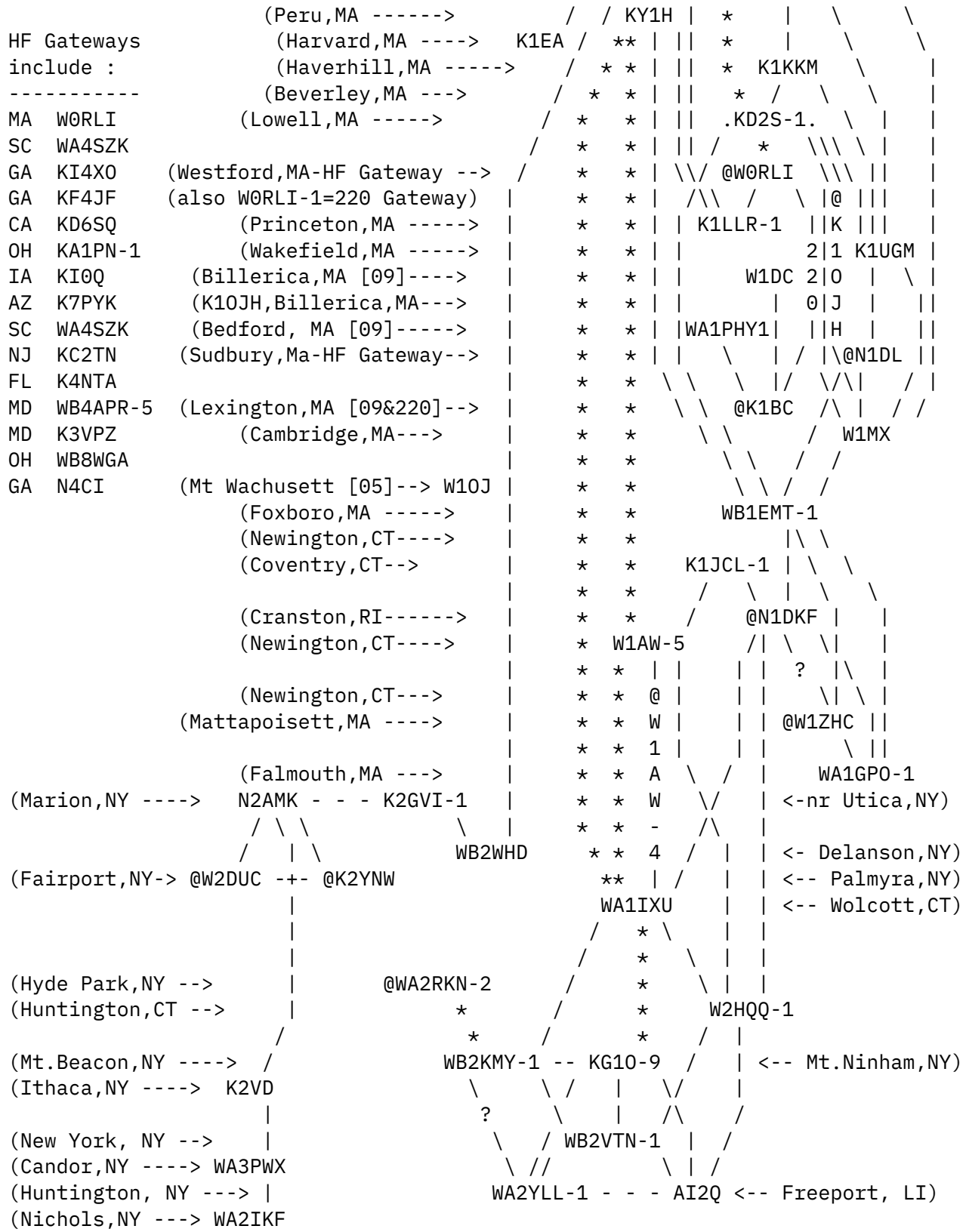
NE-MAP.19A
December 14, 1985
by N1DMM

The following is a graphic representation of Packet Radio links which are
believed to exist on 145.010 MHz in the northeastern U.S. and Canada. The
area covers eastern Canada, eastern New York and New England. Included in
these maps are digipeaters, Packet Bulletin Board Stations (PBBS), and
home stations usually left on for digipeating. Stations running W0RLI

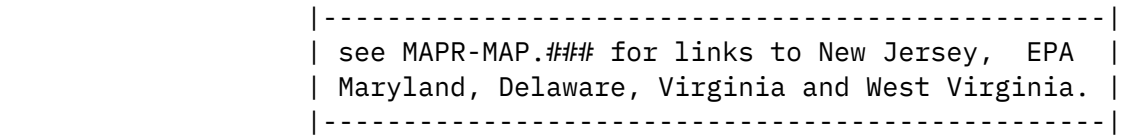
compatible software for PBBSs, Mailboxes and/or gateways are indicated by the use of the "@" character preceeding the call sign. The primary routes used for mail forwarding in EASTNET are marked with asterisks (****) while other links are shown by either a | \ or / as a connecting character. Numbers in []s indicate what frequency the link operates on. [05] indicates 145.05 MHz and [09] indicates 145.09 MHz. Unless otherwise indicated, all links operate on a frequency of 145.010 MHz.

Those links which are marked with a question mark (?) indicate a link of unknown reliability. If you have any information concerning known reliability, unreliablity or non-existence of any links shown on this map please drop me a note. Send the info to me, N1DMM @ K1BC, via one of the many auto-forwarding PBBSs.





WB2KMY links to:	KG1O-9 links	WB2VTN-1 links
WB3EIJ , WB3FSR-1	WA2SNA-2	WA2SNA-1
K3LZ-1 , WA2SNA-2		KY2D-2
KB3ZW-1,		



Please send any corrections or additions to the above linking map to
N1DMM @ K1BC via one of the EASTNET Packet Radio Bulletin Board
systems, bcn@EDDIE.MIT.EDU via Internet, or mit-eddie!bcn via UUCP.

73,
Clifford Neuman, N1DMM

From -3362556982501019431
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,1663747335a7db36,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-31 12:59:09 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site timeinc.UUCP
Path: utzoo!decvax!decwrl!greipa!pesnta!phri!timeinc!dwight
From: dwight@timeinc.UUCP (Dwight Ernest)
Newsgroups: net.ham-radio.packet
Subject: Networking Notes from N5EG (TEXNET) (4 of 4)
Message-ID: <372@timeinc.UUCP>
Date: Wed, 31-Jul-85 15:59:09 EDT
Article-I.D.: timeinc.372
Posted: Wed Jul 31 15:59:09 1985
Date-Received: Sat, 3-Aug-85 02:42:17 EDT
Reply-To: dwight@timeinc.UUCP (Dwight Ernest)
Distribution: na
Organization: Time, Inc. - New York
Lines: 127

[Note: This series of articles was found on Compuserve and downloaded
from HAMNET there on 21 July 1985 by Dwight Ernest KA2CNN 70210,523.]

An Introduction to Networks
part 4
by T.C. McDermott, N5EG
networks SIG, TPRS

This article describes some requirements for network node hardware. One of the key concepts is the idea of modular implementation - to allow for changes in the way a network is designed.

The network that has been evolving from the description in the 3 previous articles can be implemented in a backbone type of network. In this network there are two channels that are accesible at any node, the high-speed inter-node communication channel, and the 2-meter AX.25 channel. Thus the description of the hardware assumes that there are two synchronous channels per node.

Each node has the capability to move traffic along between nodes (all on the high-speed channel) and also to drop and add traffic to the high-speed channel from the low-speed channel. One of the first assumptions is that the high-speed channel will operate at 9600 bits-per-sec (b/s). For a number of reasons (the formost of which is availability) the K9NG type of FSK modem on the 220 Mhz. band will be utilized. There are some performance advantages to be obtained with PSK, but the slow carrier-recovery loops that are normally used are not always compatible with the fast T/R-switching times needed in packet service. The low-speed channel will compatible with AX.25 TNC's, and thus is a 1200 b/s channel on the two meter band.

We have thus partitioned the node into three major elements:

1. High-speed channel hardware.
   This includes 220 MHZ. radio, antennas, power splitter, 9600 b/s FSK modem (K9NG).

2. Low-speed channel hardware.
   This includes 2-M radio, antenna, and 1200 b/s AFSK modem.

3. Node-control computer.
   This includes 2 synchronous interfaces, T/R control circuits, RAM, ROM, and fail-safe sequence decoder.

A simplification of the high-speed radio circuitry is to have only one 220 Mhz. transmitter and one 220 Mhz. receiver per node. Two high-gain directional antennas are used, with a 3-dB. power splitter near the antennas. Thus communications with the northerly- and southerly- nodes is possible with one radio. Extension of this concept to three or four nodes is possible but the RF losses start to get high. The design of the high-speed portion (the backbone) allows access to the node only by other nodes. This is done to eliminate direct channel contention between users and the inter-node communication. The users of the network do not, and indeed CANNOT communicate with it on 220 Mhz. The protocol on 220 Mhz. (in this implementation) is TEXNET-IP, which IS NOT compatible with AX.25 (and indeed, for the reasons expressed in parts 1-3, should not be compatible with AX.25).

The 2-Meter section can use a commercially-available FM radio, and AFSK modem design.

Each of the radio sections contains logic-level interfaces to the node control unit. This is done to facilitate the changeout of the node control processor should a new design or network protocol standard become available. It is anticipated that resolution of the various trade-offs involved in the implementation of a network will take several years to occur. In order to solve a pressing need within TPRS, the need for long- haul communication, we will go ahead and implement TEXNET with an eye towards changes and evolving standards.

The node control computer consists of a Z80-SIO chip (which has two

synchronous HDLC-type serial channels), a Z80 (4 Mhz.) microprocessor, 16K of ROM, 32K or RAM, some timer circuitry to develop the 1200-hz, 9600-hz, and 1200 x 32 = 38400 hz. clocks. The node also has two time-out timers to prevent transmitter lock-up on the 2-m and 220 Mhz. units, contains NRZ/NRZI coder, decoder, and clock-recovery circuits for the 1200 b/s channel. It also contains a special state machine that listens to the 220 Mhz. channel and clock. This circuit recognizes a special sequence (that obeys the HDLC coding rules) and interprets the reception of this sequence as a over-riding command that uses hardware to re-boot the node processor. Each node contains a unique code in its state machine. The code is chosen to be sufficiently long that the mean time to false is 6*10^7 years (assuming random data).

A custom circuit board will be constructed to contain this controller. It may have been possible to modify one of the Xerox-820 boards, but it was felt that the changes required would reduce the reliability of the resultant assembly too much. The parts cost of byte-wide RAMs and ROMs has dropped recently, and these devices will should allow construction of the entire controller for slightly less than the price of just the 820 board when purchased surplus.

The controller will be constructed mostly of CMOS circuitry, and will be powered at +5 V through a series regulator powered from +12 VDC. This will allow a single +12 V supply. The node will contain a gel-cel battery and a charger circuit. Thus the entire node will have something approaching un-interruptable power, while still having an acceptable power supply cost.

The node controller card will be connecterized at the logic- level interfaces to the radio circuits. In the event a new controller design emerges, then upgrading of the node can be as simple as replacing the card.

One of the objectives of this network design is to keep the cost of any node low. Our goal was $500.00. We anticipate that those groups who wish to joint TEXNET will assemble, place, and maintain their node, with the assitance of TPRS. We thus would release the design of the node to those groups, and perhaps sell or supply the circuit boards needed, as well as the software for the controller. In our design, each node will have the same software, except for routing tables. A first crack at the routing problem can be attempted with static routing tables, whcih will be in ROM, and different at every site.

The subjects of routing, and other network topics will be discussed in part 5 of this series.

--

--Dwight Ernest KA2CNN \ Usenet:...vax135!timeinc!dwight
Time Inc. Edit./Prod. Tech. Grp., New York City
Voice: (212) 554-5061 \ Compuserve: 70210,523
Telemail: DERNEST/TIMECOMDIV/TIMEINC \ MCI: DERNEST
"The opinions expressed above are those of the writer and do not necessarily

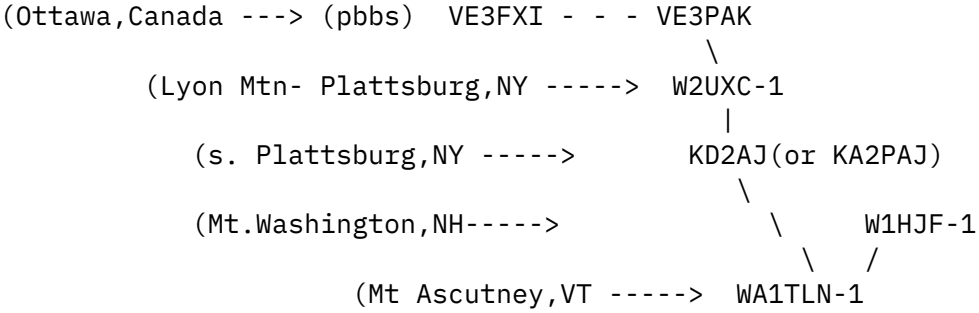
reflect the opinions of Time Incorporated."

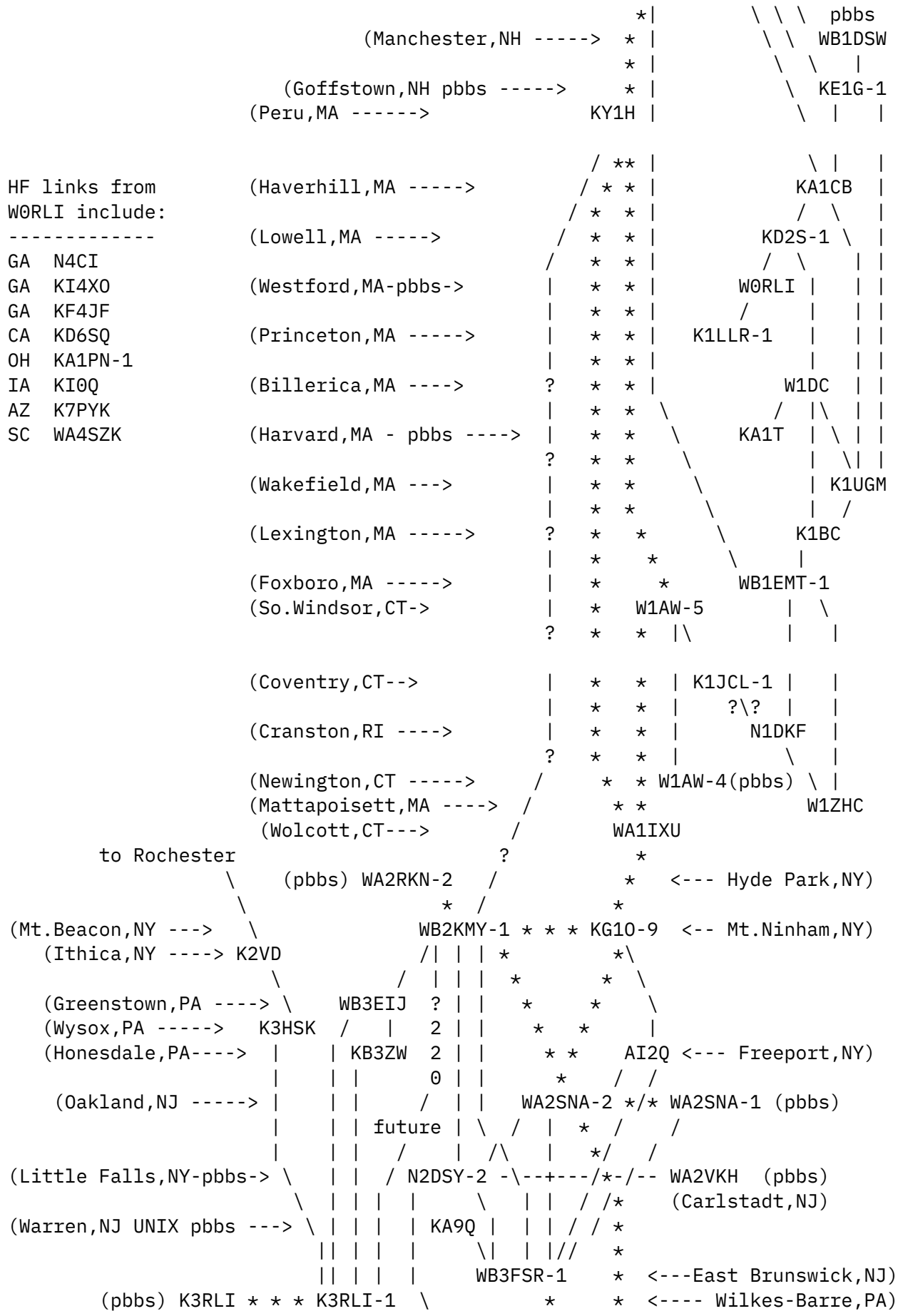
From 3911602819115633768
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,768a42edba06ece2,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-31 13:02:52 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site timeinc.UUCP
Path: utzoo!decvax!decwrl!greipa!pesnta!phri!timeinc!dwight
From: dwight@timeinc.UUCP (Dwight Ernest)
Newsgroups: net.ham-radio.packet
Subject: EASTMAP #14 -- East Coast Packet Radio Network
Message-ID: <373@timeinc.UUCP>
Date: Wed, 31-Jul-85 16:02:52 EDT
Article-I.D.: timeinc.373
Posted: Wed Jul 31 16:02:52 1985
Date-Received: Sat, 3-Aug-85 02:42:52 EDT
Reply-To: dwight@timeinc.UUCP (Dwight Ernest)
Distribution: na
Organization: Time, Inc. - New York
Lines: 160

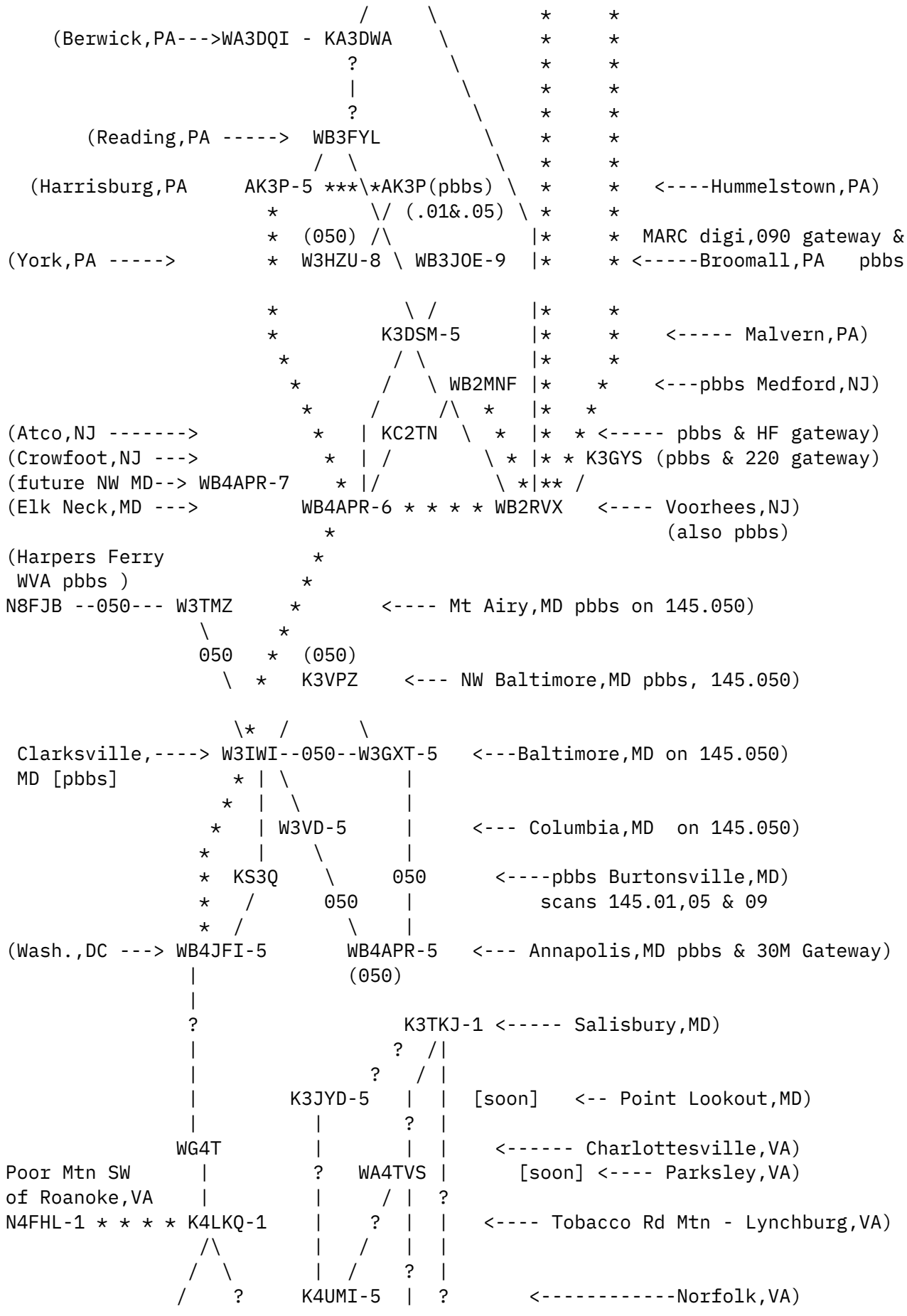
EAST-MAP.014
(revised)
June 29, 1985
by K1HTV

The following is a graphic representation of Packet Radio links which are believed to exist on 145.010 MHz on the East coast of North America. The area covers from Canada to and including the state of North Carolina. Another file called SOUTHMAP.### covers the area from Virginia south to Florida. Included in these maps are digipeaters, PBBSs, and home stations usually left on for digipeating. The primary routes used for mail forwarding in EASTNET are marked with asterisks (*) while other links are shown by either '|' '\' or '/' as connecting characters. Those links which are marked with a question mark (?) indicate a link of unknown reliability. If you have any information concerning known reliability, unreliablity or non-existence of any links shown on this map please drop me a note. Send the info to K1HTV, the keeper of the maps, via the U.S. mail or one of the many auto-forwarding EASTNET PBBSs.

==========




(Manchester,NH ----->
(Goffstown,NH pbbs ----->
(Peru,MA ------>
KY1H
pbbs
WB1DSW
KE1G-1
HF links from
W0RLI include:
GA N4CI
GA KI4XO
GA KF4JF
CA KD6SQ
OH KA1PN-1
IA KI0Q
AZ K7PYK
SC WA4SZK
(Haverhill,MA ----->
(Lowell,MA ----->
(Westford,MA-pbbs->
(Princeton,MA ----->
(Billerica,MA ---->
(Harvard,MA - pbbs ---->
KA1CB
KD2S-1
W0RLI
K1LLR-1
W1DC
KA1T
(Wakefield,MA --->
(Lexington,MA ----->
K1UGM
K1BC
(Foxboro,MA ----->
(So.Windsor,CT->
WB1EMT-1
W1AW-5
(Coventry,CT-->
K1JCL-1
(Cranston,RI ---->
N1DKF
(Newington,CT ----->
(Mattapoisett,MA ---->
(Wolcott,CT--->
W1AW-4(pbbs)
W1ZHC
WA1IXU
to Rochester
(pbbs) WA2RKN-2
<--- Hyde Park,NY)
(Mt.Beacon,NY --->
WB2KMY-1
KG1O-9
<-- Mt.Ninham,NY)
(Ithica,NY ----> K2VD
(Greenstown,PA ----> \
(Wysox,PA ----->
(Honesdale,PA---->
(Oakland,NJ ----->
WB3EIJ
K3HSK
KB3ZW
AI2Q <--- Freeport,NY)
WA2SNA-2 */* WA2SNA-1 (pbbs)
future
(Little Falls,NY-pbbs-> \
N2DSY-2
WA2VKH (pbbs)
(Carlstadt,NJ)
(Warren,NJ UNIX pbbs --->
KA9Q
WB3FSR-1
<---East Brunswick,NJ)
(pbbs) K3RLI
K3RLI-1
<---- Wilkes-Barre,PA)


(Berwick,PA--->WA3DQI - KA3DWA
(Reading,PA -----> WB3FYL
(Harrisburg,PA AK3P-5 ****AK3P(pbbs) \ <----Hummelstown,PA)
(York,PA -----> W3HZU-8 \ WB3JOE-9 <-----Broomall,PA pbbs
MARC digi,090 gateway &
K3DSM-5
<----- Malvern,PA)
<---pbbs Medford,NJ)
(Atco,NJ -------> KC2TN <----- pbbs & HF gateway)
(Crowfoot,NJ ---> K3GYS (pbbs & 220 gateway)
(future NW MD--> WB4APR-7
(Elk Neck,MD ---> WB4APR-6 * * * * WB2RVX <---- Voorhees,NJ)
(also pbbs)
(Harpers Ferry
WVA pbbs)
N8FJB --050--- W3TMZ <---- Mt Airy,MD pbbs on 145.050)
050 (050)
K3VPZ <--- NW Baltimore,MD pbbs, 145.050)
Clarksville,----> W3IWI--050--W3GXT-5 <---Baltimore,MD on 145.050)
MD [pbbs]
W3VD-5 <--- Columbia,MD on 145.050)
KS3Q 050 <----pbbs Burtonsville,MD)
scans 145.01,05 & 09
(Wash.,DC ---> WB4JFI-5 WB4APR-5 <--- Annapolis,MD pbbs & 30M Gateway)
(050)
K3TKJ-1 <----- Salisbury,MD)
K3JYD-5 [soon] <-- Point Lookout,MD)
WG4T <------ Charlottesville,VA)
Poor Mtn SW [soon] <---- Parksley,VA)
of Roanoke,VA
N4FHL-1 * * * * K4LKQ-1 <---- Tobacco Rd Mtn - Lynchburg,VA)
K4UMI-5 <------------Norfolk,VA)

```
future Sauertaun Mtn \          \   | /
site Winston-Salem,NC \         WA4KVX-1  [soon] <-----VA Beach,VA)
                       AA4L                      <----- Raleigh-Durham,NC)
```

A graphic map of Packet Radio links south from Virginia south to Florida can be found under the file name of SOUTHMAP.### , available on many of the same PBBSs carrying this EAST-MAP.### file.

Please send any corrections or additions to the above linking map to K1HTV via one of the EASTNET Packet Radio Bulletin Board systems, the U.S. mail, or a phone call. Thanks.

73,

Rich Zwirko - K1HTV
12509 Ransom Drive
Glenn Dale, MD 20769
phone (301)464-2133 (5:00-10:00 PM)

--

--Dwight Ernest KA2CNN \ Usenet:...vax135!timeinc!dwight
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Voice: (212) 554-5061 \ Compuserve: 70210,523
Telemail: DERNEST/TIMECOMDIV/TIMEINC \ MCI: DERNEST

"The opinions expressed above are those of the writer and do not necessarily reflect the opinions of Time Incorporated."

From -2411584500235096409
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e17b80368f83771e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-31 14:05:23 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site timeinc.UUCP
Path: utzoo!decvax!decwrl!greipa!pesnta!phri!timeinc!dwight
From: dwight@timeinc.UUCP (Dwight Ernest)
Newsgroups: net.ham-radio.packet
Subject: Thoughts on Packet's Future from MAPRC (1 of 2)
Message-ID: <376@timeinc.UUCP>
Date: Wed, 31-Jul-85 17:05:23 EDT
Article-I.D.: timeinc.376
Posted: Wed Jul 31 17:05:23 1985
Date-Received: Sat, 3-Aug-85 03:30:48 EDT
Reply-To: dwight@timeinc.UUCP (Dwight Ernest)
Distribution: na
Organization: Time, Inc. - New York
Lines: 80

[This file relating to the Mid Atlantic Packet Radio Council was
   downloaded on packet radio from WB2MNF digipeater in Medford, NJ
   by Dwight Ernest, KA2CNN, on 30 July 1985, and is presented
   here for consideration. There are two portions--an originating

proposal for the MAPRC, and an expression of its future plans.
I found it interesting. I hope you do too.
--Dwight ...vax135!timeinc!dwight
]

by Tom Clark, W3IWI

Since I've been commissioned to give some formal organization to the Mid-Atlantic Packet Radio Council (MAPRC) I wanted to present some thoughts on how we might go about it.

MAPRC is being formed as a formal organization to provide assistance - technical and financial - to the long-haul links in the middle of the EASTNET network. Many of the local digipeaters, BBSs, and other resources are best provided by local groups, but some facilities, particularly the new high-speed 220 MHz links may need some help. It was also pointed out at the last MAPRC meeting that many critical facilities are provided through the efforts of individuals and if they were damaged or lost we'd all be out of luck. What we'd like to do with MAPRC is provide a way to build an efficient network financed by those who use it.

MAPRC's principal area of interest was set at the first meeting to be a circle of about 100 miles from the rest stop at which the meetings are held. This takes it down to Washington, out to Harrisburg, and about 1/2 way up New Jersey. This area was chosen purposely because it was well represented at the meeting. No area was to be excluded, but we didn't want to preempt any other group. We'd welcome any group from any area which wanted to work with us.

We're going to try to get MAPRC incorporated as a not-for-profit charitable research and educational organization so that contributions would be tax deductible. There is precedent for this - TAPR, AMSAT, and PARA are charitable organizations. This would give some break to those who might contribute money, equipment, sites, etc.

We've also discussed types of membership. I proposed two classes - individual and club. Individual members would pay annual dues of something like $20, and would have all operating and voting privileges (although all network resources are now available to all packeteers, this may not continue forever). These would probably be those who are really involved in packet operations and want to have a voice in the development of the network.

Club memberships would allow other radio clubs to join and support MAPRC. A club membership would cost the club something like $200 and would allow all members of that club all operating privileges. Individual club members would have no voting rights in MAPRC, however - the club would appoint a representative to MAPRC who would have a single vote. We'd have to limit the size

of the club that could join (perhaps to 500 members) to prevent
an organization like the ARRL from joining and opening the
network to all of its members.

I hope to have a MAPRC constitution done in a couple of weeks and
I'd like to use a company in Delaware to set things up. This
done, we need an interim board of directors to volunteer until
the first organizational meeting when the first elected board
takes office. Before then I want to make application to the IRS
for the tax exemption. That will take a while.

Since MAPRC will need the support of the packet community and
must respond to its needs, I'd like some comments on this
proposal. Otherwise, this is what it's going to look like!
--

         --Dwight Ernest   KA2CNN   \ Usenet:...vax135!timeinc!dwight
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           Telemail: DERNEST/TIMECOMDIV/TIMEINC \ MCI: DERNEST

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 reflect the opinions of Time Incorporated."

From 2845615955266982050
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5ddca76f407f979a,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-07-31 14:06:35 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site timeinc.UUCP
Path: utzoo!decvax!decwrl!greipa!pesnta!phri!timeinc!dwight
From: dwight@timeinc.UUCP (Dwight Ernest)
Newsgroups: net.ham-radio.packet
Subject: Thoughts on Packet's Future from MAPRC (2 of 2) (LONG)
Message-ID: <377@timeinc.UUCP>
Date: Wed, 31-Jul-85 17:06:35 EDT
Article-I.D.: timeinc.377
Posted: Wed Jul 31 17:06:35 1985
Date-Received: Sat, 3-Aug-85 02:43:32 EDT
Reply-To: dwight@timeinc.UUCP (Dwight Ernest)
Distribution: na
Organization: Time, Inc. - New York
Lines: 224

SOME THOUGHTS ON THE PRESENT AND FUTURE OF PACKET RADIO
IN THE MID-ATLANTIC AREA

Tom Clark W3IWI

27 May 1985

A. Introduction:

There has been a lot of discussion the past few months on how we should develop our packet radio networks in the future and here are some of my ideas. First let us begin by listing the a priori knowledge that we have:

(1) Packet radio is experiencing an explosive growth. In each of our local areas in MAPRC (Balto/Wash, Philly/Trenton/SNJ, Harrisburg/York, etc.) we are seeing several new users pop up each week. The recent entry of Heath and Kantronics into the commercial market (complete with unprecedented ad campaigns), plus TAPR's TNC2, plus the series of articles that are to appear in QST this summer will all act like a magnet. In May alone, nearly 100 users have logged into the 'IWI BBS at least once.

(2) Our present networks DO work. The BBS's are serving a communications need for non-real-time electronic mail (EM) between individuals, as a focal-point for public discussions ("electronic meetings") and as a way for users to get help. They are serving as our publishing channel (why spend $0.22 to mail this to you when I can post it by radio?) so that the MAPRC confederation hasn't felt the need to start a "paper" newsletter. Assuming that such communications must extend past the coverage area of any BBS and it's associated local area network (LAN), these communications functions REQUIRE linking.

(3) Individual users want to have real-time links available to them too, whether for "conventional" QSO's or for computer-to-computer connections. Some users must use a part of the linking network just to gain access to the local BBS (e.g. the Virginia folks to use 'IWI or '3Q BBS or APR-5 HF Gateway). A growing number of users from further away want to use the linking "trunks" to access BBS's outside their LAN (the BBS DXing syndrome!). Some of the more technical types want to use the links to test advanced networking concepts before they are made "public".

(4) The "community" resources which we all enjoy were, for the most part, installed by individuals and their ultimate control lies with PEOPLE. There has been precious little community (read that to mean you all) resources (read that to mean money, hardware, digipeater sites, etc.) applied to develop the networks.

(5) Technology is rapidly improving -- K9NG has developed 9600 baud modems which will be available soon. TNC2 is already a reality, albeit still in a "beta" testing mode. AX.25 Rev.2 code which will fix some "bugs" is near at hand (it is already available in TNC2 and KA9Q X820 code). Rudimentary Level 3 (networking) software is running between the BBS's and certainly will be available for more general use within a year. W0RLI and his network of linked BBS's continues to enhance their capabilities daily. KE3Z has developed dual-ported digipeater code.

(6) One of our most valuable resources are the frequencies we use. Most of the activity is in the 145.01-145.09 range since radio hardware is easy to obtain. This range is being established nation-wide for packet use, but in the TMARC area, we only have coordinated three channels

(.01,.03,.05). 220 is not a panacea for curing all future ills for two reasons -- we may very well lose the band in the next 1 (3,5,??) years to commercial interests, and radio hardware is not readily available. Only one channel has been coordinated on 441.0 (where hardware is more readily available), and hardware is hard to come by on 1270.

Because of all the above, our skeleton system-level resources are being taxed to the limit. Users thrash with BBS activity on 145.01. People still continue sending Beacons announcing that they aren't home but their computer is! New groups want to help by putting up more digipeaters and BBS's to serve their LAN needs. Is this problem soluble? I think it is, and here are some of my ideas on HOW.

B. The User and the LAN side of things:
Central to the problem AND the solution is the user and his LAN. My prediction for the future is that packet radio will evolve towards being a non-real-time communications service. Industry has already demonstrated that electronic mail (EM) is the only practical way to tie together diverse groups that are geographically "spread out". I want to communicate when it is convenient for ME and I don't want to have to worry about the other person's schedule. The problem is compounded if multiple people need to participate in a "meeting" -- N people either have N^2 schedule conflicts or they have N^2-N separate 2-way discussions -- in either case progress is retarded.

I see the path towards orderly development involving the concepts of cellular radio. We have already seen that about 30-50 active users is about all that a BBS can accommodate without becoming a full-time job for the SYSOP and without having the individuals "thrash" for BBS access time (assuming a normal single-user BBS configuration like we have now). [It is interesting to note that FM repeater groups have discovered the same thing. The "super" repeaters with hundreds of users are able to support only brief call-and-answer communication and usually "spin-off" a new repeater for every 100 members or so.] I envision that we will see local-area "cellular" BBS's springing up to serve LAN needs.

Most, but not all of these will provide their user access on 2M (at 1200 baud) since equipment is cheap and readily available. These "cellular" BBSs will be QRP since they only need to provide direct access to a small physical area. They probably do not need to have digipeaters associated with them unless terrain and similar local conditions dictate. Adjacent "cells" would have coordinated frequencies so that they don't hear each other. A theorem in topology states that ANY map can be "painted" in four colors, with no adjacent areas having matching colors; therefore given a perfect world, four frequencies should be able to have minimal thrashing given QRP LAN coverage by all stations. Given my premise that 2M is the LAN frequency of choice, and the present 145.01-.09 band, these four channels are .03, .05, .07 and .09 (if we were to choose to enter the 15 vs. 20 khz repeater war, we could stretch this to provide one more channel by adopting 15 khz spacing).

C. Linking the LAN's:
Nobody wants to "talk" only with people in his own LAN -- that's what

networking is all about. At present EASTNET exists only on 145.01 and thrashing is occurring because LAN functions go on at the same time as legitimate network activities. INDIVIDUAL USERS AND NETWORKS "TRUNKS" CANNOT COEXIST!!

In the evolution of our system, the network should serve to interconnect the LANs, and the BBS's (or other gateway stations) provide the user interface into the network. INDIVIDUAL USERS SHOULD NOT ACCESS THE NETWORK "TRUNKS" DIRECTLY.

Our present networks are fragile and easily broken. If WB2RVX points his beam north to access WA2SNA, then access thru Mike from APR-6 is marginal; and Mike is an experimenter at heart -- sometimes his station is doing other things. A single-point failure at a key site causes us to lose everything. The present bastardized network using dumb digipeaters requires end-to-end acknowledgements. Let us assume that a station has a 90% probability that a given packet will get to the next station, and a 90% probability of receiving the ack back. Then .9*.9 of his packets = 81% of his packets will make it thru (with ack) on the first try, and he will have to retry once out of 5 transmissions. This presents no serious problem other than the fact that 19% of the channel time is being wasted. However if 7 hops were needed, then the thruput goes down to 0.9^14 = 22.9% and only one packet out of 5 makes it the first time! The result -- the channel is clogged and nothing works. The Level 3 development work is intended to remove the need for end-to-end acknowledgement. The BBS's right now do this Level 3 function now in their mail forwarding -- IWI does not attempt to connect with W0RLI to get stuff to Boston, instead IWI passes the buck by sending it to WB2MNF, who then worries about the next hop up the coast.

The problem is aggravated if one of the key relay stations is situated in the midst of heavy LAN activity. Typical local users will be running small antennas and simply not hear the remote stations at all; the result is that LAN users on link frequencies kill the link! INDIVIDUAL USERS SHOULD NOT BE ON LINKING FREQUENCIES!

At present, all we have is .01 (and HF) for linking. The same frequency is used by users and network gateways. Users also need to access the network directly since they do not have direct access to the gateways. The solution seems to me to be to build a second, redundant network in parallel on different frequencies. This second network should run the highest possible speeds consistent with reliability and affordability. Right now, the winner seems to me to be the K9NG 9600 baud design. Hopefully boards will be available soon. To go along with these modems, we need to begging implementing multi- (or at least dual-) ported digipeaters; the KE3Z design based on the venerable X820 board seems to be the logical choice. And we need to establish a source of good, reliable radios and antennas. It appears that 220 is the best choice, even considering that 220 is new "turf" for many of us, and that hardware is harder to find, and that the FCC might choose to cave in to the commercial interests and pull the band out from under us. If not 220, then the next place we have to go is 1270, and that will probably be even a tougher nut to crack since even less hardware is now available.

The 2M links on .01 should be maintained. For now it is all we have. When the higher speed links are in place, .01 can serve as an independent backup. And .01 can be the frequency for individual users to gain access to the longer-haul links for their own purposes.

D. A Plague on BBS DXing!:
As a special case of the problem just discussed, I want to cite a growing cancer in our midst -- BBS DXing!! The past couple of months have seen a large number of new users come on. The links have been improving with the addition of WA2SNA-2 in NNJ. Here I have seen a growing number of new users who seem to be unaware of the fragility of EASTNET. The will call in to IWI with 5-6 hop paths that look like (the call xxx is suppressed to protect the actual offenders from Bronx cheers!):

xxx <=> WA1IXU <=> KG1O-9 <=> WA2SNA-2 <=> WB2RVX <=> WB4APR-6 <=> W3IWI

Somehow, their one-way connect request packet arrives at IWI and with the AX.25 handshaking, the BBS send a connect ack and assumes that we are connected. It then tries to log the person on, and tries again, and again, and again until the BBS's timers say "Sorry Charlie" and hang up. Then xxx, having perhaps seen a packet or two coming thru from the BBS sez "Geez, this is nifty. I think I'll try again" and starts the whole cycle over again. In a 13 day sampling period in May, of 273 connections logged on the IWI BBS on 145.01, a total of 96 (=35%) ended with timeouts. INDIVIDUAL USERS SHOULD NOT ACCESS BBS'S THRU MORE THAN 2-3 DIGIPEATERS!!! BBS's are there to serve LAN and network gateway functions -- BBS DXING SHOULD BE BANNED!! I am considering adopting the anti-social solution to this problem by putting those folks who show up in the "timeout" list onto the "banned user" list and invite comments on the acceptability of this approach.

E. Getting it all together:
The fragile system we now have was built by individuals as an experiment. It works! It paves the way for the future. The individuals cannot be expected to continue to provide ALL the hardware as a gratuity just 'cuz they are nice guys. The new wave of users who want the services will have to begin carrying their share of the load. The LAN BBS's and local coverage digipeaters are the logical province of local clubs and groups. The shared resource, to which all must contribute is the interconnecting network. Parts of the network are going to require WORK!!! New sites for key linking stations have to be acquired AND MAINTAINED. Special hardware -- high speed modems, multi-port digipeaters, radios, etc. -- all have to be built and paid for. And the whole network has to be coordinated. I envision the Mid-Atlantic Packet Radio Council -- MAPRC -- serving that coordination role. It remains to be seen if that role includes only technical coordination or if it also will include the financial/managerial functions too. I ask MAPRC to consider these ideas and begin forging packet radio's future destiny NOW. If we don't act now, then I feel that we are in danger of having uncontrolled chaos in the future.

--
--Dwight Ernest KA2CNN \ Usenet:...vax135!timeinc!dwight
Time Inc. Edit./Prod. Tech. Grp., New York City

Voice: (212) 554-5061 \ Compuserve: 70210,523
Telemail: DERNEST/TIMECOMDIV/TIMEINC \ MCI: DERNEST
"The opinions expressed above are those of the writer and do not necessarily
reflect the opinions of Time Incorporated."

From 5086546362852714030
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,c9d41945f7f43007,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-01 07:58:51 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10 5/3/83; site mtunh.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mtunh!jak
From: jak@mtunh.UUCP (Jim Kutsch)
Newsgroups: net.ham-radio.packet
Subject: TAPR TNC2 AVAILABLE!!!
Message-ID: <487@mtunh.UUCP>
Date: Thu, 1-Aug-85 10:58:51 EDT
Article-I.D.: mtunh.487
Posted: Thu Aug 1 10:58:51 1985
Date-Received: Sat, 3-Aug-85 02:28:09 EDT
Organization: AT&T Information Systems Laboratories, Holmdel, NJ
Lines: 78

From drnet ...
KEYS:/TNC 2 AVAILABILITY/COME AND GET 'EM!/
TO: (Group 95), WA7GXD

A N N O U N C E M E N T !

TAPR TNC 2 NOW AVAILABLE!{

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a) the manual, which is at the printers and is expected back on the 16th, and

b) the cabinet end plates, which will ship to TAPR on or before the 10th of September. The first units will be shipped

WITHOUT the cabinet end plates; the end plates will be sent to TNC 2 owners as soon as TAPR receives them.

The price for TNC 2 is $185 plus $10 S & H. A credit card order incurs a 3% surcharge (that's what the bank charges us) for a total of $200.85. Arizona residents must add tax, of course.

To order your TNC 2 kit, follow these simple rules:

1) Call the TAPR Office at (602) 746-1166

2) Have the following information available

   * Your Name

   * Your UPS shipping address (no PO Boxes, please)

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3) Two shipping labels (one for the TNC 2, one for the cabinet end end plates) will be filled out WHILE YOU ARE ON THE PHONE.

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Thank you for your continued support of TAPR and

The Packet Radio Revolution!

From -6672067351272428906
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,c9d41945f7f43007
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-01 15:40:35 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site mhuxm.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!mhuxm!abeles
From: abeles@mhuxm.UUCP (J. Abeles (Bellcore, Murray Hill, NJ))
Newsgroups: net.ham-radio.packet
Subject: Re: TAPR TNC2 AVAILABLE!!!
Message-ID: <403@mhuxm.UUCP>
Date: Thu, 1-Aug-85 18:40:35 EDT
Article-I.D.: mhuxm.403
Posted: Thu Aug 1 18:40:35 1985
Date-Received: Sat, 3-Aug-85 02:12:48 EDT
References: <487@mtunh.UUCP>
Organization: AT&T Bell Laboratories, Murray Hill
Lines: 15

>   A N N O U N C E M E N T !
>
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>
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> of the new TAPR TNC 2.   In field testing since January, it is now
> ready for you!
>
etc.

My question is (I'm a licensed ham, WB2OOD), what is packet radio?
What frequencies does it operate on? If it like cellular telephones,
who pays for the stations?

--J. Abeles

From 1755501982911565639
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,fb32ff6c41583870
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-01 22:27:45 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10 5/3/83; site mtunh.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!drutx!mtuxo!mtunh!jak
From: jak@mtunh.UUCP (Jim Kutsch)
Newsgroups: net.ham-radio.packet
Subject: Re: does this exist?
Message-ID: <481@mtunh.UUCP>
Date: Tue, 16-Jul-85 23:19:29 EDT
Article-I.D.: mtunh.481
Posted: Tue Jul 16 23:19:29 1985
Date-Received: Thu, 18-Jul-85 05:37:35 EDT

References: <3252@drutx.UUCP>
Organization: AT&T Information Systems Laboratories, Holmdel, NJ
Lines: 10

The net.ham-radio.packet newsgroup exists on some systems but not all. The original control message creating the group was thought by some system administrators to be in error and rm group control messages were sent.

I have recreated the group earlier this afternoon. Everyone should know this time that it is not an error and we should have connectivity with the packet-radio ARPA mailing list soon.

73, Jim KY2D

From -931258748927609483
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5d0961a36be10558,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-02 10:32:37 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!
F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
From: F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
Newsgroups: net.ham-radio.packet
Subject: WA8DED multi channel firmware running in DL
Message-ID: <4846@mit-eddie.UUCP>
Date: Fri, 2-Aug-85 13:32:37 EDT
Article-I.D.: mit-eddi.4846
Posted: Fri Aug 2 13:32:37 1985
Date-Received: Sat, 3-Aug-85 10:22:58 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 11

From: F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
We got the WA8DED PROM-listing via ARPA and BITNET, copied it from our IBM 3084Q to a floppy disk in RT-11 format, then to CP/M and ISIS. DL1HK then burned the PROM's and put one into his TAPR-TNC.
The firmware ran at once without any errors (giving very usefull info on the packets transmitted in the monitor mode which a TAPR will not give, packet header, protocol identifier, connect request packets).
DF7HI (who has a PBBS running here in Hamburg/DL) thinks he can modify his PBBS program to accept 4 user simultanously using only one TNC.
Karl-Heinz DK8HI

From 1656550906630848444
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,68d15e34cb5b5c7d,start

X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-03 04:50:46 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!harvard!think!mit-eddie!
KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: TAPR TNC2 available
Message-ID: <4848@mit-eddie.UUCP>
Date: Sat, 3-Aug-85 07:50:46 EDT
Article-I.D.: mit-eddi.4848
Posted: Sat Aug 3 07:50:46 1985
Date-Received: Sun, 4-Aug-85 06:30:06 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 75

From: The Root of all Evil <root%petrus.uucp@BRL.ARPA>

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X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,aebe33ca5d44542e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-06 07:52:26 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10 5/3/83; site mtunh.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!harvard!talcott!panda!genrad!decvax!
tektronix!uw-beaver!cornell!vax135!ariel!mtunf!mtunh!jak
From: jak@mtunh.UUCP (Jim Kutsch)
Newsgroups: net.ham-radio.packet

Subject: Gateway Vol. 1 No. 24
Message-ID: <488@mtunh.UUCP>
Date: Tue, 6-Aug-85 10:52:26 EDT
Article-I.D.: mtunh.488
Posted: Tue Aug 6 10:52:26 1985
Date-Received: Mon, 12-Aug-85 01:41:51 EDT
Organization: AT&T Information Systems Laboratories, Holmdel, NJ
Lines: 386
Gateway: The ARRL Packet-Radio Newsletter Volume 1, Issue 24 July 23, 1985

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ARRL
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Newington, CT 06111
203-666-1541

Editor:
Jeffrey W. Ward, K8KA

FIGHTING FIRES WITH PACKET RADIO

This report on packet-radio communications during the Lexington and Santa Cruz Mountain (California) Wildfire was filed by Ken Chong, WB6MLC, and edited by Hank Magnuski, KA6M.

"During the afternoon of Sunday, July 7, reports were being received by the local Amateur Radio Emergency Service (ARES) District Emergency Coordinator (DEC) that a new fire had been discovered in central Santa Clara County near the Lexington Reservoir, about 60 miles south of San Francisco.

"Since the 4th of July the local ARES 'Strike Team' had been assembled and put on alert. This particular amateur radio team, unlike previous ones, was equipped with a complete packet radio station. Late that Sunday, the team was called out to set up operations at the Alma Fire Station to handle communications concerning resources, tactical messages, fire updates and evacuation notices.

"Throughout the day and further into the week, Fire Status Updates were sent out over packet when the voice nets were tied up. Once, when the phone lines were busy, packet radio got through to KA6YRK at another fire camp in San Luis Obispo, in Southern California. Many operators who had never operated packet before were literally baptized by fire!

"On Tuesday, July 9, with the fire leaping rapidly from hill to hill, the main base camps and staging areas were moved to Vasona Park in Los Gatos. The towns of Los Gatos and Saratoga were severely threatened and many held their breath, hoping that evacuation orders would not be issued. At 'Vasona Com,' where

the future amateur operations were to originate, a well-equipped van from the Palo Alto Red Cross was set up with packet equipment and an IBM PC programmed for use as a terminal. Two other radios for the voice nets were also in the van. Again, packet radio continued to function when the voice nets were busy.

"One glaring problem, receiver desense, reared its ugly head during the operations. The local mountaintop digipeater was also malfunctioning, and two meter full-duplex repeaters were pressed into service. The retry rate increased so much because of the intermod products and desense that the packet technical crew transferred all digital traffic to full-duplex voice repeaters on 440 MHz. Finally, with the packet net secured on 440 MHz, all relays of fire updates to the different base camps continued without interference from the nearby two-meter radios.

"Thanks to the hard work and contributions of many, the packet operation at the main fire camp solved one more disturbing problem. The large pool of fresh operators had little or no experience with TNCs. Most had barely heard of TAPR! The IBM PC was cleverly programmed to use its function keys to connect, disconnect and send various 'canned' messages. By Thursday, July 11, the whole operation was almost foolproof. At last an untrained operator could sit down and keep the net going.

"Packet radio did an outstanding job in proving to the fire officials its usefulness in an emergency and at the fire camps. The initial strike team of Frank Kibbish, WB6MRQ; Kit Blanke, WA6PWW and Bob Tarone, WA6ZBX and the packet setup crew of David Palmer, N6KL and WB6MLC were pleased with what evolved during the course of the emergency. When the smoke clears, a more detailed report will be filed.

VIA DRNET

ANOTHER FIRE REPORT

Paul Hansen, KA6UPD, sent in a newspaper article detailing some of his activities as a packet-radio operator assisting California firefighters. The article appeared on the front page of the July 14 edition of the Thousand Oaks, California, News Chronicle, and it carried a photo of Paul and Jerry Boone, emergency coordinator for Ventura County ARES. The article gives some description of packet radio and the of work done by ARES members in the California disasters. Several paragraphs are devoted to the reasons that Amateur Radio operators get involved in public service. Paul is quoted, saying, "We have an obligation to give public service to pay back for the right to use the frequency space we have." Ray Volkmar, leader of the Conejo Valley Disaster Action Team, says that public service stems from "a love of our hobby and a love of being able to do something for someone else."

VIA KA6UPD.

FIELD DAY REPORTS

It looks like a lot of stations took advantage of the 100-point packet-radio bonus this Field Day. The following reports detail some successes and some lessons learned.

In The Chawed Rag, newsletter of the Richardson (Texas) Wireless Klub, George Baker, W5YR, reports that "unfortunately, the packet station performance left much to be desired...Only one QSO could be managed. But that produced another 100 points. On 145.01 MHz, where the packet action took place, the racket has to be heard to be believed. At times it sounded like one long 'brrrap' as one packet followed another the instant the frequency was clear. It was a good demonstration of how packet allows a lot of stations to work on the same channel concurrently without QRM.

"I 'printed' stations from all over Dallas and Tarrant counties...Many stations were extending their range by using the 'digipeater' capability of the AX.25 packet protocol.

"Field Day has shown that packet can add another dimension to traditional contest modes, as well as proving that you can take reasonably delicate home computer equipment and set it up in the field under adverse conditions and make it play...Packet radio is really out there, and it is beginning to 'intrude' into areas of ham radio that formerly were the exclusive domain of CW or phone."

David Cheek, WA5MWD, of the Texas Packet Radio Society, operated at the K5QHD Field Day site in Garland, Texas.

"More than twenty three packet stations in the North Texas Section participated in the Field Day. About half were operating in the field, on emergency power. At K5QHD in Garland, we made 20 contacts, while two stations in Ft. Worth, made 23 each. At least two other stations went over 15 contacts, including W5CR in Athens. The best DX on two meters was the Salado contact on packet. Huston packet stations made lots of contacts with the help of the WD5GAZ digipeater.

"We learned a few lessons: First, make sure all of your packet equipment is ready to operate in the field. Try to have 25 watts or more and an antenna at least 30 feet high. Second, finding a route to a station can be difficult, as is learning the call of the distant station you want to connect to. This can be handled by some limited beaconing, with each station continuously monitoring to gather new information about who is operating were. This can all also be mapped out in advance. Third, excessive beacons can seriously slow down traffic on the frequency and

should never be any more frequent than once every ten minutes. Beacons must include useful information, such as, 'reach me through KC5LW-1, WB5QNG and WA5MWD'. Fourth, the frequency must be kept as clear of other traffic as possible. This is no different from any other emergency operation. Finally, in a real emergency operation, two people are needed for each packet station. One will operate the transmitter while the other types traffic into a message computer. Only a station handling very little traffic -- less than ten ARRL radiograms per hour -- can be operated by one person."

There are two Field Day reports in the June/July issue of the NEPRA PacketEar, newsletter of the New England Packet Radio Association. John Langner, WB2OSZ, operated with the Billerica (Massachusetts) Amateur Radio Society. They only made a few contacts, but did use packet radio to receive the official Field Day bulletin and send a message to the Section Manager. The packet operators explained packet to those who had never seen it and may have inducted a few new packeteers.

Robert Gettys, N1BRM, was the sole packet operator at the Framingham (Massachusetts) Amateur Radio Association Field Day. Robert found that the lack of a second operator familiar with packet kept the station from being operated for the full contest period. He "found that you can't teach someone who doesn't understand the concepts of computers in general how to run a packet station and 'search' for possible contacts...or even enough [to conduct] a simple contact." Robert made 21 contacts, and he was able to send and receive Field Day messages from the K1BC PBBS.

Robert concludes that we need to find a recognized procedure for soliciting contacts (calling CQ), and he also notes that beacons and PBBSs contributed to severe channel congestion. His article ends with a few questions that the packet-radio and contesting communities should begin to think about:

o Should packet be used in contests at all?
o If so, in which contest(s)?
o What rules should be specified concerning digipeaters, beacons and frequencies?
o Should contacts with PBBS or stations under automatic control count?

Robert feels that because Field Day is as much a test of emergency communication as it is a contest, packet radio is probably appropriate for Field Day. He is less sure about other contests.

If you would like to put forth answers to any of Robert's questions, send a letter to Gateway and to the members of the ARRL Contest Advisory Committee.

CHAWED RAG, DRNET, PACKETEAR.

EASTNET NOTES

Gary Hoffmann, AK3P, in Hummelstown, Pennsylvania, has his W0RLI MailBox system running on 145.05 MHz as well as on 145.01 MHz. This allows users of the 145.05 MHz digipeater in York to access his system. Gary is using two radios in parallel to implement his dual-frequency node. He hopes to install a true multiport digipeater in the future. Gary is also planning to add an HF port to his MailBox, with antennas beamed toward Europe.

Tom Clark, W3IWI, is also operating a MailBox with both 145.05-MHz and 145.01-MHz inputs. Tom, however, is using the W0RLI GateWay software to connect the two frequencies. To reduce the congestion that is beginning to bother everyone on 145.01 MHz, all local users in Baltimore and Washington D.C. have been encouraged to use the 145.05-MHz port. This helps keep 145.01 MHz open for EASTNET traffic entering and leaving the Washington area. The 145.05-MHz input is served by the W3GXT-5 (Baltimore) and W3VD-5 (Laurel/Columbia) digipeaters. The novel thing about this installation is that the radios for the two ports are combined using an RF-hybrid combiner to drive a single power amplifier and antenna.

Tom sends these other notes: W0RLI MailBox systems are beginning to be used as personal mailboxes. Three new digipeaters on 145.05 MHz are W3TMZ in Mt. Airy, Maryland, K3VPZ near Baltimore and N8FJB in Harper's Ferry, West Virginia. Also, Bob Bruninga, WB4APR, has his Commodore VHF-to-30-meter gateway software converted to support commands and mail forwarding like a W0RLI system. So, the Baltimore/Washington network has the following major stations on 145.05 MHz: N8FJB, W3TMZ, K3VPZ and WB4APR-5. W3IWI has a GateWay between 145.05 and 145.01 MHz, and KS3Q scans 145.01, 145.05 and 145.09 MHz. All of these stations are linked by automatic mail forwarding.

VIA EASTNET.

NEWS FROM SOFTNET

The Swedish SOFTNET User Group (SUG), in Linkoping, Sweden, has had its third workshop. SOFTNET is an experimental packet-radio system that uses distributed processing to provide network services. The SOFTNET nodes run at 100 Kbits/s and are remotely programmed in a FORTH-like computer language. [For more background on SOFTNET, see Gateway Number 5.] The following report on the SOFTNET workshop is from the newsletter SOFTNET News.

The event was attended by about 50 SUG members and other

participants from Sweden and Denmark. The first session started with introductory talks on the SOFTNET concept. These talks were followed by a hardware session which was dominated by Ingvars, SM5LRF, who presented the latest news on the Softnet radio transceiver [100-kbit/s modem]. While the transceiver has been available for about six months, minor modifications to improve the performance are continuously being made. During the lunch break, there were demonstrations of SOFTNET nodes and connections to several main-frame computers.

The first session after lunch was devoted to SOFTNET programming. Fritte, SM5PSL, talked about activities of the SOFTNET Specification Group and presented some of the group's proposals. Peter, SM5PQZ gave a talk on the implementation of an algorithm for distribution of system software through intelligent network flooding.

An interesting talk on some of the commercially available packet radio systems was given by a member of the Swedish Telecommunications Administration. SOFTNET-like systems are of great interest to the Administration because they can solve data communication problems for fixed and temporary networks in difficult terrain.

The next session was on packet radio in satellite systems. Sigge, SM5KUX, presented some of the plans on SWASAT, a Swedish Amateur Radio Satellite which is to carry advanced, high-speed packet-radio experiments. An interesting paper on the design of a doppler-shift adaptive modem for the IC-251/451 was also presented.

The workshop concluded with a panel discussion chaired by Carl-Lennary, SM5ELD. Among the biggest issues of the discussion was the negative view of digital communications and packet radio taken by the HF Working Group of the IARU. The participants urged the spreading of more information to bring on a more positive attitude towards packet radio and experimental activities in general.

VIA SOFTNET NEWS, SM5PSL.

QSL TO HELP DRNET

One of the constant sources of Gateway news is DRNET, a computerized conference that is part of the New Jersey Institute of Technology's, Electronic Information Exchange System (NJIT EIES). NJIT is interested in knowing how many people are served by DRNET. As Gateway readers, you all receive regular DRNET information. Please send a post card to

CCCC @ NJIT
Tom Moulton, W2VY

323 King Blvd
Newark, NJ 07102.

Tom is the NJIT "sponsor" of DRNET, and he would like to be able to show that the 30 DRNET accounts are actually serving several thousand information-starved packeteers. He is also interested in how far messages from DRNET get distributed. On your card to Tom, tell him your name, call, location and packet setup, how you got the message, how often you receive messages that originate on DRNET, the name of your local packet group and the number of members in your group. The few minutes that you take to do this will help keep a vital source of information active.

VIA DRNET.

COHERENT DEMODULATION?

Fred Weidenhammer, W4SDL/2 writes that he is looking into the application of the techniques involved in coherent CW (CCW) to HF packet demodulation. If you are interested in this, contact Fred and experiment. His address is

322 Blacksmith Road
Levittown, NY 11756.

FROM W4SDL.

600-Hz SHIFT FOR HF PACKET?

While all of the stations using packet radio on HF are using 200-Hz shift at 300 bauds, there has been a lot of discussion of eventually using wider shifts. To start some public dialog and experimentation on this matter, we present here a letter sent to Gateway by Dr. Alan Chandler, K6RFK, of Advanced Electronic Applications.

"The 200-Hz shift that is becoming the defacto standard for 300-baud HF packet has a substantial deficiency when on an ionospheric path. Due to differential path length, both frequencies may be present simultaneously at the receiver and will generate a beat frequency. If the beat frequency is greater than the highest desired harmonic of the data, it may be filtered out and will not be a problem. If it is lower, the beat will be treated as data by the TU and will generate errors. In the case of 300-baud data, the fundamental is 150 Hz, and the minimum 3rd harmonic should be passed. This gives a minimum shift of 450 Hz, and to allow economical filters, the minimum shift should be 600 Hz. The TAPR and TAPR equivalent modems will receive 600 HZ shift without modification and they can easily be adjusted to transmit 600-Hz shift tones (1400 and 2000 Hz)."

FROM AEA.

MINICOMPUTER ON PACKET

St. Louis Amateur Packet Radio (SLAPR) has acquired a DEC PDP-8 minicomputer. They would like to put the machine to some practical use on the local packet network. Because there are already several mailboxes on the St. Louis ares, the club is interested in using the PDP-8 to store and distribute large files like Gateway. If you have any expertise that you might donate to this SLAPR project, contact

Pete Eaton, WB9FLW
35 Norspur, Route 4
Edwardsville, IL 62025.

VIA DRNET.

REPRODUCTION OF GATEWAY MATERIAL

Material may be exerpted from Gateway without prior permission, provided that the original contributor is credited and Gateway is identified as the source.

From -8608285935101540568
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,31cbc84b186ec485,start
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X-Google-ArrivalTime: 1985-08-09 11:05:32 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!decvax!genrad!mit-eddie!ctabka@sri-tsc
From: ctabka@sri-tsc
Newsgroups: net.ham-radio.packet
Subject: more data on tapr2 needed
Message-ID: <4920@mit-eddie.UUCP>
Date: Fri, 9-Aug-85 14:05:32 EDT
Article-I.D.: mit-eddi.4920
Posted: Fri Aug 9 14:05:32 1985
Date-Received: Mon, 12-Aug-85 23:09:22 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 14

From: David Wolfe <ctabka@sri-tsc>

There was a recent announcement about the availability of the TAPR II TNC. Does anyone have the particulars on...

a.)addresses and phone for purchase inquiries
b.)prices
c.)date of availabilities

Also, what are the capabilities of this new box and how does
it differ from the older version.

Dave (WA4YSS)

From -7323385703978935478
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,68dfbf972b782f45,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-09 12:11:43 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!decvax!genrad!mit-eddie!F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
From: F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
Newsgroups: net.ham-radio.packet
Subject: Source code for TNC
Message-ID: <4921@mit-eddie.UUCP>
Date: Fri, 9-Aug-85 15:11:43 EDT
Article-I.D.: mit-eddi.4921
Posted: Fri Aug 9 15:11:43 1985
Date-Received: Mon, 12-Aug-85 23:10:09 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 5

From: F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
Hello!
Does anyone know if one can get the PASCAL source code for the
TAPR TNC-1? Preferably over the network...
Karl-Heinz DK8HI

From 1416881232371823972
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,80ae577e9f3493b7,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-12 11:07:57 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!lll-crg!dual!qantel!ihnp4!mhuxn!mhuxr!
ulysses!gamma!epsilon!zeta!sabre!bellcore!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Availability of TAPR source code
Message-ID: <463@petrus.UUCP>
Date: Mon, 12-Aug-85 14:07:57 EDT
Article-I.D.: petrus.463
Posted: Mon Aug 12 14:07:57 1985

Date-Received: Mon, 19-Aug-85 05:03:04 EDT
Distribution: net
Organization: Bell Communications Research, Inc
Lines: 31

To obtain a copy of the TAPR TNC-1 code, you should:

1) Send a letter requesting same to:

Harold Price
1211 Ford Av
Redondo Beach, CA 90278

2) State in the letter that the code is for your own personal use,
and you will not redistribute it for money, use it to make roms and sell
the roms for money, or in any way take the efforts of many people over
many weeks who did it for free and try to make money off it.
A simple "I won't use this for profit" will suffice.

3) Supply a return mailer and postage.

The source is available on 8" SSSD CP/M disk (please send a formatted disk),
or 5 1/4" IBM PC disk. If you send IBM PC disks, you have two choices,
the TNC code as it currently sits on the TNC, or a version suitable for
compiling with microsoft Pascal and run as a simulator on the PC. Specify
which one you want, or send two disks.

As part of the 4.0 effort, the TNC code was prodded and now runs under
Turbo Pascal as well. That code won't be available until after 4.0 is released.
4.0 should go into testing at the end of this month.

Note that an OEM package which allows you to make money off this is available,
contact TAPR directly. The number is (602) 746-1166.

Harold Price, NK6K
bellcore!csisb!harold

From 6248681416486250041
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,3fbde05194ac42c8,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-13 06:48:45 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!harvard!think!mit-eddie!hoffman%pitt@csnet-relay.arpa
From: hoffman%pitt@csnet-relay.arpa
Newsgroups: net.ham-radio.packet
Subject: RS232 problem with TAPR TNC 1
Message-ID: <4954@mit-eddie.UUCP>
Date: Tue, 13-Aug-85 09:48:45 EDT
Article-I.D.: mit-eddi.4954

Posted: Tue Aug 13 09:48:45 1985
Date-Received: Wed, 14-Aug-85 08:40:37 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 36

From: Bob Hoffman <hoffman%pitt@csnet-relay.arpa>
I can't believe that I'm the first to find this, but I haven't seen mention of this problem on any of the nets I monitor. In fact, I'm a bit embarrassed that it's taken me 18 months to notice it!

The problem was: While my computer terminals would work just fine with my TNCs, I had problems when I connected my computer. The computer is a DEC LSI-11, and the interface used is the DLV11-E, which is a full-modem-control interface. When the computer was connected, no data would flow. The confusion was compounded when I inserted a breakout box between the TNC and the computer -- it started working! Remove the box -- no data flow.

Last night, I found the cause: When TAPR designed the TNC, they wired the Carrier Detect (CD, pin 8) as an INPUT! This is completely wrong for an RS232 DCE. It turns out that my terminals have no connection to the CD pin, therefore the pullup resistor on the TNC supplies a high level, allowing the data to flow. The DLV11-E, on the other hand, does use pin 8, also as an input. With both CD inputs in parallel, the pullup resistor is insufficient to insure a high enough level. The TNC (actually the 6551) sees CD negated, and no data flows. Regarding the breakout box, my guess is that inserting the box somehow raised the voltage on pin 8 to a point where it would work.

The quick fix is to jumper pins 8 and 20 on the TNC. This makes the DTR signal from the terminal drive both DTR and CD on the TNC. This works OK.

Another fix I have considered is to take the "connected" status line from the parallel port (DB25P pin 16) and run it through an RS232 driver to pin 8. Then, the CD line acts like you would want it to when running a BBS.

Is there something I may have missed here? Why would TAPR design their board this way? Your comments are appreciated.

73,
Bob Hoffman, N3CVL {allegra, bellcore, cadre, idis, psuvax1}!pitt!hoffman
Pitt Computer Science hoffman%pitt@csnet-relay

From -8930021206929821173
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,cc226a3db4b98ff,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-13 09:08:33 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!harvard!think!mit-eddie!
F33PAP%DHHDESY3.BITNET@WISCVM.ARPA

From: F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
Newsgroups: net.ham-radio.packet
Subject: Source code for TNC
Message-ID: <4960@mit-eddie.UUCP>
Date: Tue, 13-Aug-85 12:08:33 EDT
Article-I.D.: mit-eddi.4960
Posted: Tue Aug 13 12:08:33 1985
Date-Received: Wed, 14-Aug-85 08:41:04 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 5

From: F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
Hello!
       Does anyone know if one can get the PASCAL source code for the
TAPR TNC-1? Preferably over the network...
   Karl-Heinz   DK8HI

From -5747339259077663881
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,ab59d73ecd58eb2e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-13 11:02:45 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!harvard!think!mit-eddie!allegra!nsc!nsc-
pubs!diamond
From: diamond@nsc-pubs.ARPA
Newsgroups: net.ham-radio.packet
Subject: packet-radio mailing list address update
Message-ID: <4964@mit-eddie.UUCP>
Date: Tue, 13-Aug-85 14:02:45 EDT
Article-I.D.: mit-eddi.4964
Posted: Tue Aug 13 14:02:45 1985
Date-Received: Thu, 15-Aug-85 08:25:45 EDT
Sender: uucp@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 6

From: allegra!nsc!nsc-pubs!diamond (Stephen L. Diamond)
I'm on the packet radio mailing list, and our wizard has
told me that the address you're currently using is unnecessarily long.
He suggests nsc!diamond@decwrl.ARPA as a better address. Thanks.

Steve Diamond

From 4390607015027919192
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d2a68a6dac5729b9,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-15 09:50:34 PST

Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!harvard!think!mit-eddie!hoffman%pitt@csnet-relay.arpa
From: hoffman%pitt@csnet-relay.arpa
Newsgroups: net.ham-radio.packet
Subject: My previous comment about the TAPR TNC-1 RS232
Message-ID: <4986@mit-eddie.UUCP>
Date: Thu, 15-Aug-85 12:50:34 EDT
Article-I.D.: mit-eddi.4986
Posted: Thu Aug 15 12:50:34 1985
Date-Received: Mon, 19-Aug-85 20:33:22 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 49

From: Bob Hoffman <hoffman%pitt@csnet-relay.arpa>
Thanks to Harold Price, NK6K, I got a speedy reply to my comment/question about the use of the CD line on the TAPR TNC-1. Here's the forwarded reply, comments in [] are mine:

>From bellcore!csisb!harold Thu Aug 15 04:39:28 1985
To: pitt!hoffman

Bob,

Here's the answer to your TNC hardware question, straight from the designer. Please pass it on to net.ham-radio.packet or wherever the original request went. tnx.

[From Lyle Johnson, WA7GXD, TAPR President]
Harold,

The strange use of the CD line in TNC1 is well documented.
See Hardware Chapter 5 page 18 and 19. [I missed this (oops)]

The RS-232C spec calls for a "0" level to be greater than +3 volts. It also specifies that the input impedance of a device should be greater than 7k ohms. If our 1489 IC on the TNC is 7k and the attached device is 7k, we have a 3.5k load to ground. But our pullup is 6.8k returned to +12 v. So, the point should never see less than about +4.0 volts.

So, it SHOULDN'T be a problem.

It is, however, somewhat flakey. TNC 2 does not have this "feature" of allowing an input or an output. Part of the reason we did it this way was becasuse we knew of some folks who have the TNC attached to a telephone modem at a remote site on a hill and operate packet radio via telephone!

Anyway, the solution Bob came up seems to work fine...

(anyone got an egg scraper..there's some on my face...)

Lyle

---
bellcore!csisb!harold

Many thanks go to Harold and Lyle for their prompt reply.
--
Bob Hoffman, N3CVL {allegra, bellcore, cadre, idis, psuvax1}!pitt!hoffman
Pitt Computer Science hoffman%pitt@csnet-relay

From -1092468953495895897
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d2a68a6dac5729b9
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-15 10:24:10 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!
hoffman%pitt@csnet-relay.arpa
From: hoffman%pitt@csnet-relay.arpa
Newsgroups: net.ham-radio.packet
Subject: My previous comment about the TAPR TNC-1 RS232
Message-ID: <4987@mit-eddie.UUCP>
Date: Thu, 15-Aug-85 13:24:10 EDT
Article-I.D.: mit-eddi.4987
Posted: Thu Aug 15 13:24:10 1985
Date-Received: Sun, 18-Aug-85 04:48:04 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 49

From: Bob Hoffman <hoffman%pitt@csnet-relay.arpa>
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Anyway, the solution Bob came up seems to work fine...

(anyone got an egg scraper..there's some on my face...)

Lyle

---
bellcore!csisb!harold

Many thanks go to Harold and Lyle for their prompt reply.
--
Bob Hoffman, N3CVL   {allegra, bellcore, cadre, idis, psuvax1}!pitt!hoffman
Pitt Computer Science   hoffman%pitt@csnet-relay

From -2285331109416693218
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,28f511dab0672efb,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 11946d,28f511dab0672efb,start
X-Google-Attributes: gid11946d,public
X-Google-ArrivalTime: 1985-08-17 10:07:31 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site amdahl.UUCP
Path: utzoo!linus!philabs!prls!amdimage!amdcad!decwrl!sun!amdahl!sjl
From: sjl@amdahl.UUCP (Steve Langdon)
Newsgroups: net.dcom,net.ham-radio.packet
Subject: Standards for commercial packet radio
Message-ID: <1919@amdahl.UUCP>
Date: Sat, 17-Aug-85 13:07:31 EDT
Article-I.D.: amdahl.1919
Posted: Sat Aug 17 13:07:31 1985
Date-Received: Tue, 20-Aug-85 07:13:43 EDT
Distribution: net
Organization: Amdahl Corp, Sunnyvale CA

Lines: 14
Xref: linus net.dcom:991 net.ham-radio.packet:30

I have a friend who is doing some work that involves the use of packet radio
for commercial wide area networking. He asked my if I was aware of any
standards (in the ANSI, ISO, etc. sense) for packet radio. Although I am
involved in communications standards work, I could not think of any groups
working on this subject. Is there someone on the net who could provide
me with information on work (or the absence thereof) in this area.

Please reply by mail. If I find out anything that appears to be of broad
interest I will post it.
--
Stephen J. Langdon   ...!{ihnp4,cbosgd,hplabs,sun}!amdahl!sjl

[The article above is not an official statement from any organization
  in the known universe.]

From -7551486300377033503
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,abb204d00434eac3,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-21 07:23:48 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84 exptools; site ihlpg.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!ihlpg!retzner
From: retzner@ihlpg.UUCP (Retzner)
Newsgroups: net.ham-radio.packet
Subject: What is your opinion about Packet Radio on 220 Mhz?
Message-ID: <1108@ihlpg.UUCP>
Date: Wed, 21-Aug-85 10:23:48 EDT
Article-I.D.: ihlpg.1108
Posted: Wed Aug 21 10:23:48 1985
Date-Received: Sat, 24-Aug-85 13:59:09 EDT
Distribution: na
Organization: AT&T Bell Laboratories
Lines: 33

I am posting this request to gain information for Art Reis K9XI,
editor of 220 NOTES.

BACKGROUND:
There is a strong start of packet radio on 2 meters at 1200 baud.
This strong start has already brought congestion in certain areas
especially on 145.01 Mhz. There are current plans to build backbone
systems on 220 Mhz. It would be beneficial set aside segment of the
220 Mhz band for packet use. It also might be useful to move some
of the local traffic (QTH to backbone, QTH to QTH) to 220 Mhz.
2 meters upper baud limit is 1200 baud, the 220 Mhz upper baud
limit is 19200.

QUESTIONS:

1) What frequencies on 220 Mhz should the backbone systems use?
2) What frequencies on 220 Mhz should local traffic use?
3) Should local traffic stay at 1200 baud or would 9600 baud be more
   efficient?
4) How much bandwidth is needed for the higher baud rates?
5) Should more elaborate signaling techniques be used for the higher
   baud rates to keep the signal's bandwidth to a minimum?
6) How much must a radio be customized for PSK operation, can the
   radio be modified for PSK and still be used for FM voice
   communications?

If you any other ideas or concerns that I did not think of please
comment on those also. I will try to summarize the responses for
the net.

Thanks and 73.

Bill Retzner WB9QXJ
ihnp4!ihlpg!retzner

From -209952443201506197
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,12f2329989d7517d,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-22 13:38:09 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!ctabka@sri-tsc
From: ctabka@sri-tsc
Newsgroups: net.ham-radio.packet
Subject: military,commercial packet radio
Message-ID: <5075@mit-eddie.UUCP>
Date: Thu, 22-Aug-85 16:38:09 EDT
Article-I.D.: mit-eddi.5075
Posted: Thu Aug 22 16:38:09 1985
Date-Received: Sun, 25-Aug-85 04:11:16 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 79

From: David Wolfe <ctabka@sri-tsc>

  I currently work at the integration contractor for the DoD
experimental packet radio network and I thought that I might be
able to extend some of the points that Phil Karn mentioned.
  Firstly, the IP protocol is used because it provides a bare
bones capability that allows dissimilar networks to intercommunicate
with low overhead. If virtual circuit capability is desired, it
can be added by implementing an appropriate Host-Host protocol on
top of it (TCP is an example) in a modular way. Other protocols
that provide different degrees of service run on top of IP.
Amateur radio would do well to consider IP for any contemplated

national networks for several reasons...

1.) The design has been done
2.) It can run on small, simple gateways (i.e. it`s cheap)
3.) It works (not the least consideration)
4.) It allows the decisions about higher level services to be delayed until the patterns of network use stabilize.
5.) The ham networks will be able to internet with a wide variety of other computer networks.
6.) And as Phil mentioned, datagrams are reasonable for adapting around disasters, topology changes and system crashes.

Approaches such as using X.75 or other internetwork schemes based on virtual circuit models should be reconsidered because...

1.) If one guy in the tandem chain crashes, all current calls going through the switch get lost.
2.) The phone company solves problem 1. by using highly (some of the most highly reliable ever) reliable switches. This implies the use of fault tolerant machines for the communication subnet routing function, an approach that is useful for large corporations but not hams trying to build a network on the cheap. Also it is worth remembering that the phone company is partially locked into this way of doing things because it is a natural extension of the preexisting telephone technology (an important consideration with the size of the existing phone plant).
3.) The virtual circuit way can always be built on top of datagrams anyway if that`s what people want.

For these reasons, I find the talk about basing Ham networks on X.25/X.75 to be very depressing.

There are currently several DoD experimental networks running around the country. There is also some military PR work being done over in the UK. The technology seems to work fairly well,but it is difficult to tell when it will be deployed operationally. There has been a packet radio testbed in the Bay area since about 1974.

The commercial situation is almost totally undeveloped and may be retarded by the advent of Cellular telephone. Probably the most interesting idea for commercial packet radio is to use it to distribute computing services in third world countries where they have not been building telephone services for 100 years. Reliable PR nets can be set up in the wilds without depending on End or Mobile Telephone Offices.

Finally, one of the reason that spread spectrum and packet radio go so well together is that the use of SS increases the capture properties for the packets (similar to FM capture familiar to hams) in the face of multipath. This is worth keeping in mind as SS seems about to become legal on some bands. The challenge is to build a low cost approach to SS as the radios that we use (about the size of an IC290, cost about 12K) are far too expensive. This advantage pertains to civilian nets as well. There are some additional advantages that arise out of SS that briefly are.

1.) Using different spreading codes to that different nets
    can operate on the same band.
2.) Low probability of intercept for snoopers
3.) If the spreading codes are combined with cryptography, you
    get increased communications security.
4.) If number 2. is turned around, communications that is more
    jam resistant (The 2 meter repeater guys would love it!)
5.) It provides the basis for precision range measurements.

(The preceeding does not represent the policies of SRI International,
DARPA, or in fact, anyone else but the author)

Dave Wolfe WA4YSS

From -185592541575395539
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,97c34afa7a76030a,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-25 20:31:36 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site pitt.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!rochester!cmu-cs-pt!cadre!pitt!hoffman
From: hoffman@pitt.UUCP (Bob Hoffman)
Newsgroups: net.ham-radio.packet
Subject: TAPR TNC 2 command list
Message-ID: <1311@pitt.UUCP>
Date: Sun, 25-Aug-85 23:31:36 EDT
Article-I.D.: pitt.1311
Posted: Sun Aug 25 23:31:36 1985
Date-Received: Thu, 29-Aug-85 08:31:43 EDT
Reply-To: hoffman@pitt.UUCP (Bob Hoffman)
Organization: Univ. of Pittsburgh Computer Science
Lines: 163

I found this on CompuServe's HamNet. I thought it might be of
interest.

TNC 2 and [FADpad] commands, release 1.1.0
NOTE - when "Same as kit" appears, the operation is the same
for TNC 2/FADpad as for the TAPR TNC 1

COMMAND	ARG	DEFAULT	VALID RANGE/DESCRIPTION
8bitconv	Y|N	N	When YES, permits the 8th bit in CONVERSE mode to pass between the user and the TNC
AUtolf	Y|N	N	Same as kit
Ax25l2v2	Y|N	N	When off, valid C bits are forced to 0 and all connections are pre version 2.0 AX.25 lev 2. When on, connections with other v2 compatable tnc's are attempted and allowed, but

```
                        the tnc reverts to pre version 2 if QSO is
                        with an older TNC
AWlen    7|8       7    Same as kit.  Applies only after cold start/reset
AXDelay  n         0    0<=n<=180 x 10ms
AXHang   n         0    0<=n<=20 x 100ms
Beacon   E|A n     E 0  0<=n<=250 x 10sec
BKondel  Y/N       Y    Same as kit
BText    ss        ""   1<=strlen(ss)<=120
BUdlist  Y|N       N    When Yes, the LCALLS listed are termed buddies and
                         any frames originated by stations other than
                         those in the list are IGNORED in monitor mode
                        When No, the LCALLS listed are termed lids and
                         are ignored as above.
CANline 0-7fH     ^x(18h) Same as kit
CANpac   0-7fh     ^Y(19h)
COMmand 0-7fh     ^c(03h) Same as kit
Connect  call/via  N/A  same as kit, no trailing TRANS or CONV allowed though
CHeck    0-250x10S 300 sec  T3 or WormTIME, if v=2 or v<2 connection
                            respectively
CMdtime  0-250x1S  10sec     same as kit
CMSg     Y/N       N         When on, the specified by the CText command is
                             packetized and sent upon establishment of a
                             connection
CPactime Y/N        N        "    "
CR       Y/N        Y        "    "
CText    string    blank     Message sent to people connecting (e.g. I'm
                            in jail, call next week) depending on the
                            setting of CMSG
CALibr                      enter calibrate mode, valid commands in calibrate
                    mode are: K-toggle PTT, Q-quit CAL mode, D-dotting,
                     space bar - key toggles hi/low state on the NRZ>NRZI
                         encoder
CALSet   0-65535 (UNKNWN) count setting for comparison while in CAL routine.
                      CALSET = (1+(525000/Fd))
CONOk    Y/N        Y    same as kit
CONMode T/C       C    same as kit
CONStamp Y/N       N    When on, the daytime stamp is printed with
                             all *** CONNECT messages
CONVerse                    same as kit
DAytime  yymmddhhmm         If parameter is present, the software clock/
                             calender is started for MHeard logging
                             and CONS/Mstamp functions
                            If it is not present, the daytime is displayed
                             in a form depending on the setting of
                             the DAYUSA flag (see below)
DAYUsa   Y/N       Y    When on, the daytime stamp is displayed in the
                             form common in the U.S.
                            When off, the daytime stamp is displayed in the
                             European form
                            ( eg:
                             cmd:DAYUSA OFF
                             DAYUSA  was ON
                             cmd:DAYTIME
```

```
                              23-02-85  11:05:30
                              cmd:DAYUSA ON
                              DAYUSA  was ON
                              cmd:DA
                              02/23/85  11:05:30
                            )
DELete   Y/N       N    Same as kit
DIGipeat Y/N       Y    Same as kit
Disconne                same as kit
DISPlay  [A|C|I|L|M|T|] Same as kit EXCEPT Async replaces the Terminal class,
                                    Timing mimics TIming class
                            note: BUdlist and LCAlls settings are NOT displayed
                               Comments?
DWait    0-31x10mS   160ms      same as kit, except DWait
                        is ignored when there are outgoing digipeat frames
                            pending
Echo     Y/N       Y    Same as kit
EScape   Y|N       N    Same as kit
Flow     Y/N       Y    Same as kit
FRack    1-15x1S   3    same as kit
FUlldup  Y/N        N    "     "
HEaderln Y|N       N    When ON, a newline is stuck between the ':' of
                            a monitored header and the I
HId      Y|N       N    When ON, enables the HDLC id frame which is formed
                             at the correct times if the TNC is being used
                             as a digipeater.
                            When OFF,
                             prevents ANY hdlc id INCLUDING a forced ID cmd
ID       n/a               The ID command may be issued to force a
                             final identification, used for example when
                             taking a digipeater off the air.
LCAlls   c[,c,...] blank_list     c must be a valid call/ssid pair and their
                            may be up to 8 addresses.
LCok     Y|N       Y    Same as kit
LFadd    Y/N       N    Same as kit
MAll     Y/N       Y    Same as kit
Monitor  Y/N        Y   "     "
MCon     Y/N        Y   "     "
MCOM     Y/N        Y   enables monitoring of <C>onnect, <D>isc, <UA> and
                            <DM> frames
MHeard                  displays heard log
MHClear                 clears the heard log
MFilter  n[,n..]  <default empty> chars filtered from monitored output
                            0<=n<=7fh
MRpt     Y/N       Y    when enabled, displays the path selected and traversed
                      (eg. WB9FLW>AD7I,K9NG*,N2WX-7*,WA7GXD,NK6K,WB6YMH:HI PAUL
                         vs. WB9FLW>AD7I:HI PAUL)
MStamp   Y/N       N    When on, monitored frames are "stamped" with
                             the current daytime (if set)
MYcall   callsign  NOCALL-0   same as kit
MAXframe 1-7        4        "      "
NUcr     Y/N       N    Same
NULf     Y/N       N    Same
```

```
 NULLs    0-30      0    true NULLS are sent out.  Timing is not performed.
                          otherwise, same as kit
 Paclen   n        128   0<=n<=255. n==0 interperted as 256
                              otherwise, same as kit
 PACTime  E|A n     After 0    0<=n<=250 * 100ms otherwise same as kit
 PARity   n         Even 0<=n<=3
                         n         parity
                          x   0         no parity
                          0   1         odd parity
                          1   1         even parity
 PASs     0-7fh     ^v(16h)   Same -- NOTE diff default than kit. COMMENTS?
 PASSAll  Y/N       N         When ON, the reciever does not check
                              for correct CRC on rcvd frames.
                               (note MHeard logging is disabled
                                when PASSAll is ON)
 REDispla 0-7fh     ^r(12h)   same as kit
 REtry    0-15      10        same as kit
 RESET                         Resets TNC][ and loads default settings. Power
                               down to reset using BBRAMed settings
 RESptime 0-250x100Ms  1.2 sec    this is the setting used for T2
       {NOTE- T2 is used in both AX25L2V2 and !V2 connections}
 Screenl  0-255     0    Same as kit
 SEndpac   0-7fH     0DH  same as kit
 STArt    0-7fh     11H   "    "
 STOp      "        13H   "      "
 Trans              same as kit
 TRACe    Y/N       N   Dump of received frames only.
                         NOTE min abbr changed from <0.0.7
 TRFlow   Y/N       N    When ON, software flow (using START and STOP)
                         is used for transparent connections
 TXdelay   n        30   0<=n<=64 x 10ms
 TXFlow  Y/N       N    Same as kit
 Unproto   string    blank         same as kit
 Xflow    Y/N       Y    same as kit
 XMitok   Y/N       Y    same as kit
 XOff     0-7fh      13H "    "
 XON       "         11H        "
--
Bob Hoffman, N3CVL       {allegra, bellcore, cadre, idis, psuvax1}!pitt!hoffman
Pitt Computer Science    hoffman%pitt@csnet-relay


From -3176603414644146058
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,dbd1139cfd76aacf,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-25 20:34:44 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site pitt.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!bellcore!
decvax!genrad!panda!talcott!harvard!seismo!rochester!cmu-cs-pt!cadre!pitt!hoffman
From: hoffman@pitt.UUCP (Bob Hoffman)
Newsgroups: net.ham-radio.packet
```

Subject: WA8DED Firmware update
Message-ID: <1312@pitt.UUCP>
Date: Sun, 25-Aug-85 23:34:44 EDT
Article-I.D.: pitt.1312
Posted: Sun Aug 25 23:34:44 1985
Date-Received: Wed, 28-Aug-85 11:05:59 EDT
Reply-To: hoffman@pitt.UUCP (Bob Hoffman)
Organization: Univ. of Pittsburgh Computer Science
Lines: 42

Forwarded from CompuServe's HamNet...

#: 31525 S9/Packet/RTTY/AMTOR
    19-Aug-85 03:46:37
Sb: WA8DED TAPR Code
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: All

The following message ported from the WA6OSA Packet Mailbox:

*** Message from WA6OSA to ALL entered Thursday 01-Aug-85 at 8:45 PM
*** Subject: ++NEW IMPROVED++ WA8DED FIRMWARE FEATURES

Version 0.9 of the WA8DED firmware for the TAPR TNC-1 compatables is now
available. It is written in 6809 assembly language and is contained in two
2764 EPROMs. Some of its outstanding features are:

1. Up to four simultaneous connects (plus unproto).
2. Easy to read 'monitor' frame information in unproto mode.
3. Simple 'On Screen' Calibration.
4. Digipeats version 2 protocol.
5. Meaningful channel status display (separate status for each channel).
6. Supports modem baud rates up to 9600 baud.
7. New-Improved Host Mode (for computer interface).
8. Display of link state and number of free buffers.
9. XON-XOFF flow control
10.Auto-Unattended/Beacon Mode.

Version 1.0 should be available around the first of September and is contained
in two 2764 EPROMS. The W6IXU mailbox is currently using a beta version 0.9 of
the WA8DED firmware.

I have been using 0.7 for over a month now and prefer it to the original
firmware. Both WA6RWN and WB6AIE-1 digipeaters are currently using 0.5.

                Try it. You'll LOVE it!!!

*** End of message from WA6OSA

--
Bob Hoffman, N3CVL   {allegra, bellcore, cadre, idis, psuvax1}!pitt!hoffman
Pitt Computer Science   hoffman%pitt@csnet-relay

From 8746851125491789423
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,14fe6853154d990f,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-25 20:38:36 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site pitt.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!bellcore!
decvax!genrad!panda!talcott!harvard!seismo!rochester!cmu-cs-pt!cadre!pitt!hoffman
From: hoffman@pitt.UUCP (Bob Hoffman)
Newsgroups: net.ham-radio.packet
Subject: TAPR TNC 2 Status Report
Message-ID: <1313@pitt.UUCP>
Date: Sun, 25-Aug-85 23:38:36 EDT
Article-I.D.: pitt.1313
Posted: Sun Aug 25 23:38:36 1985
Date-Received: Wed, 28-Aug-85 11:06:16 EDT
Reply-To: hoffman@pitt.UUCP (Bob Hoffman)
Organization: Univ. of Pittsburgh Computer Science
Lines: 127

Four messages forwarded from CompuServe's HamNet...

#: 31610 S9/Packet/RTTY/AMTOR
    21-Aug-85 01:26:33
Sb: #TAPR
Fm: Harold Price, NK6K 71635,1174
To: all

The lines are now closed for the nite. Calls dropped to 0 soon after 9:00,
guess folks are following the guidelines, thanks everyone. We're preparing a
report on activities now, watch this space in an hour or so. Preliminary looks
show that no one area of the country seemsed to be "locked out" over any other
area. Even the DX came in, 16 orders from Alaska, 13 from NY, {_27 from TX. A
full report to follow. We'll be on the phones again tomorrow. Orders taken
tomorrow will be in the mid-sept range, until order #600. (we're on 497 now).
nk6k, wb9flw, and wa7gxd, the nite time DJs.

#: 31613 S9/Packet/RTTY/AMTOR
    21-Aug-85 02:30:32
Sb: #tnc2 status report day 2
Fm: Harold Price, NK6K 71635,1174
To: all

A preliminary report from TAPR. 10:30pm PDT 8/20/85
every 3.5 min or so. Average time between calls was 5 seconds. The
maximum time was about 10 seconds, except when the local telco switch
crashed. This rate was sustained on both 8/19 and 8/20 from 9:00am
till 9:00pm.
.
The following are totals for phone orders by State/Province:
AL 6; AK 16; AZ 6; AR 2; CA 83; CO 12; CT 8; DE 0; DC 1; FL 9;

GA 10; HI 1; ID 0; IL 9; IN 11; IA 1; KS 1; KY 2; LA 1; ME 0;
MD 12; MA 16; MI 4; MN 2; MS 1; MO 4; MT 1; NE 0; NC 12; ND 0;
NH 2; NJ 15; NM 2; NY 13; NV 1; OH 11; OK 10; OR 1; PA 10; RI 0;
SC 3; SD 1; TN 5; TX 27; UT 8; VT 0; VA 9; WA 17; WV 4; WI 3;
WY 0; Nova Scotia 1; Ont 7; SAS 1; QU 3;
.
This is a total of 381 calls handled in 24 hours of phone time, or
3.7 minutes per call. As you can see, being in AZ was no help at
all, although it seems CA was the place to be.
.
We did hear from the phone company at around 1:00pm the first day. It
seems that the main switch in the Tucson CO had crashed three times, and
all long distance trunks were jammed. We noticed at least one occasion
where the phone didn't ring for 30 seconds, and when we checked, there
was no dial tone. The phone CO asked us to check with them next time,
as they have a special prefix in the area for "Radio call in shows" and
the like. They also asked if we could stop the calls. Pete explained that
we couldn't. (Pete will be taking future calls from a pay phone near
his home).
.
We are unaware of any action by the phone company to alter the traffic flow,
although we can assume they did something to protect the network. There
was no effect on the call rate at 746-1166.
.
Although phone orders currently total 381, the order numbers passed out
included beta units, and after the first 280 kits, mail orders. All order
numbers up to 290 will be included in the first batch which are due to
ship the week of August 26. All following order numbers up to 600 will
be in the second batch which should ship by mid-September. Due to the
demand, which exceeded even our expectations, we will continue to take orders
past 600, which will ship in October. If conditions warrant, we will
attempt to increase production for October to meet demand.
.
We apologize for the difficulty in reaching the office, but will continue
to work 9:00am to 9:00pm until the phone calls slacken. We will keep
you advised. Thank you for your continued support of TAPR and the
Packet Radio Revolution.
.
>From the TAPR Nite Time DJs (we play the hits), WA7GXD, WB9FLW,
N0CCZ, NK6K.

#: 31648 S9/Packet/RTTY/AMTOR
    22-Aug-85 01:15:04
Sb: #Dxpedition Report - TNC2
Fm: Harold Price, NK6K 71635,1174
To: all

.   !! News Flash from TNC 2 Central !!
****
While we did not achieve W.A.S. with sticker for twisted pair (missing
Maine, Vermont and Wyoming), nor even reverse DXCC (we did get VK, OH,
LA, VE, JA, YV, and a couple others) the pile-up has thinned out somewhat.
The telephone calls are down to about a 50% duty cycle since noon local

time today (Wednesday). A full list by states will be published at
the end of the week. We did pick up DE, ID, ND, NE, and RI today.
.
Well over 600 TNC 2s will be making their way to the hands of persistent
packeteers, with the first batch due to ship Monday, 26 August (we got
the good news from the printer today! Manuals should definitely be in our
hands on Friday...). Numbers 301 through 600 (plus or minus a couple)
should ship out by mid-September. Order numbers above 600 will ship
out in October (although we are taking measures to see if that can't
be moved up to very late September).
.
TAPR is of course still accepting orders on a "business as usual" basis.
This means multiple orders, mail orders processed same day received when
possible, etc. We are planning our October production to reach a "ship
from stock" status as early in that month as possible.
.
Your TAPR HotLine crew ("we play the hits"), consisting of NK6K, WB9FLW,
N0CCZ and WA7GXD, on behalf of TAPR, wish to extend our heartfelt thanks
to all of you who particpated thus far in the initial sale of TNC 2.
It makes it all worthwhile! We'll start again tomorrow morning at
9:00am Tucson Time with order number 642. QRZ?

#: 31734 S9/Packet/RTTY/AMTOR
    24-Aug-85 11:32:56
Sb: TAPR News Update
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: All

The following information ported from DRNET:

TAPR NEWS!

Units up to order #142 were shipped Friday, the rest will go Monday. They have
taken up to order #713 which is the October shipment. They are back to regular
hours of 9AM to 5:30 PM, and are happy to take orders.

(The above information was taken off the recording on 602-746-1166) (so no need
to call until next week...)

--
Bob Hoffman, N3CVL   {allegra, bellcore, cadre, idis, psuvax1}!pitt!hoffman
Pitt Computer Science   hoffman%pitt@csnet-relay

From 6198843280608458798
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5eec8301363fa45b,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-26 05:56:42 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!harvard!think!mit-eddie!Dbennett%xmm-

plexus01.amc@amc-hq.arpa
From: Dbennett%xmm-plexus01.amc@amc-hq.arpa
Newsgroups: net.ham-radio.packet
Subject: Listing of Packet Radio Bulletin Boards
Message-ID: <5111@mit-eddie.UUCP>
Date: Mon, 26-Aug-85 08:56:42 EDT
Article-I.D.: mit-eddi.5111
Posted: Mon Aug 26 08:56:42 1985
Date-Received: Thu, 29-Aug-85 20:05:11 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 64

From: Dbennett%xmm-plexus01.amc@amc-hq.arpa
The following message was forwarded to me by W3IWI in Baltimore and I thought
it would be of interest to all. If anyone has additional information let me
know.

Msg# TR Size To   From   @ BBS Date   Title
6324 BN 1682 ALL   WB2RVX W3IWI 850817 Forwarded from WB2RVX at 0422Z
 867 BN 1617 ALL   WA2RKN W3IWI 850816 de WA2RKN-2 @ 1808 UTC
1632 BN 1556 ALL   KE1G   W3IWI 850816 Linked bbs network
At KE1G: 2188 From W0RLI Rcd 850815/1628 Sent 850816/0703z
At W0RLI: 5774 From W0RLI Rcvd 850815/1220. Sent 850815/1628
The following stations run bbs's of one nature or another.
All are linked by way of automatic forwarding.
  List as of 08/15/85

 W1AW-4   NEWINGTON, CT   (ARRL HQ STATION)
 K1BC   LEXINGTON, MA
 N1DL   SUDBURY, MA   (HF/VHF GATEWAY)
KE1G-1   GOFFSTOWN, NH
 N1DKF   CRANSTON, RI
WB1DSW   EAST KINGSTON, NH
WA1LRL-1   BEVERLY, MA   (145/441 GATEWAY)
WB2MNF   MEDFORD, NJ
AI2Q   FREEPORT, NY
WA2RKN-2   HYDE PARK, NY
WB2RVX   PENNSAUKEN, NJ
WA2SNA-1   WAYNE, NJ
KC2TN   ATCO, NJ   (HF/VHF GATEWAY)
WA2VKH   CARLSTADT, NJ
 N2WX-1   PALM BAY, FL
KC3BN   HARRISBURG, PA
WB3EYB   HARRISBURG, PA
 K3GYS   ATCO, NJ
 W3IWI   CLARKSVILLE, MD   (145.01/145.05 GATEWAY)
AK3P   HUMMELSTOWN, PA
KS3Q   BALTIMORE, MD
WA3QFN   MARGATE, FL
 K3RLI   WILKES BARRE, PA
 K3VPZ   GRANITE, MD   (HF/VHF GATEWAY)

KA4AHO	ORLANDO, FL	(HF/VHF GATEWAY)
N4CI	ATLANTA, GA	(HF/VHF GATEWAY)
KF4JF	HAHIRA, GA	(HF/VHF GATEWAY)
NK4K	MIAMI, FL	
K4NTA	STUART, FL	(HF/VHF GATEWAY)
WA4SZK	FLORENCE, SC	(HF/VHF GATEWAY)
K4TKU	MIAMI, FL	
KI4XO	MARIETTA, GA	(HF/VHF GATEWAY)
WB4ZNW	MOULTRIE, GA	
WB5VUL-1	PALO ALTO, CA	
WA5MWD	GARLAND, TX	
W5XO	GAUSE, TX	(HF/VHF GATEWAY)
W6CUS-1	RICHMOND, CA	
KD6SQ	RANCO CUCAMONGA, CA	(HF/VHF GATEWAY)
WB7DCH	ENUMCLAW, WA	(HF/VHF GATEWAY)
K7PYK	SCOTTSDALE, AZ	(HF/VHF GATEWAY)
WA0JFS-1	DES MOINES, IA	
KC0OJ	BATTLE CREEK, IA	
NA0P	AMES, IA	
KI0Q	AMES, IA	(HF/VHF GATEWAY)
W0RLI	WESTFORD, MA	(HF/VHF GATEWAY)
NA0S	AMES, IA	
AI0Z	ROLAND, IA	
VE3FXI	OTTAWA, ON	

From 5267256825431819717
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,267d36b6d476b137,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-29 09:54:49 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!bellcore!
decvax!genrad!mit-eddie!CHEPPONIS@CMU-CS-C.ARPA
From: CHEPPONIS@CMU-CS-C.ARPA
Newsgroups: net.ham-radio.packet
Subject: Pressing Issues for Packet Radio Development
Message-ID: <5144@mit-eddie.UUCP>
Date: Thu, 29-Aug-85 12:54:49 EDT
Article-I.D.: mit-eddi.5144
Posted: Thu Aug 29 12:54:49 1985
Date-Received: Sat, 31-Aug-85 07:54:51 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 28

From: Mike Chepponis <Michael.Chepponis@CMU-CS-C.ARPA>
There are many things we packeteers should be doing, such as helping new users,
setting up networks, installing and maintaining BB systems, etc. But there are
two areas that I think work should be done, and I'm soliciting comments on
why one should be done vs the other. They are:

1) Develop a small, cheap, yet flexible TNC which does AX.25.
   I believe a z80 system with just 5 other chips could do it; so
   far, total parts/board/power costs are about $30.

2) Develop high-speed modems and implement TCP/IP. "High-speed" here
   means 56 kb/sec, because that is the maximum rate allowed on 220 and
   440 bands; really high-speed stuff will have to be on 1240 MHz.

On (1), I think that having really cheap, flexible TNCs means that many more people will get on packet, we'll have that many more BBS stations, more gateways, etc. Price is important! I envision a top speed of 9600 baud for the TNC.

On (2), If somebody doesn't demo a TCP/IP system soon, it's possible the VC folks will, and that may become the de-facto standard (Yeech!). Also, I believe that slow speeds and levels 3/4 don't mix, so high-speed modems are necessary.

Comments appreciated, 73, -Mike, K3MC

p.s. C U at MARPC meeting September 7.

From -3000812606433116567
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,92d04510f32809ef,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-29 21:16:52 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!
ucdla%ucbtopaz.CC@Berkeley
From: ucdla%ucbtopaz.CC@Berkeley
Newsgroups: net.ham-radio.packet
Subject: packet radio mailing list
Message-ID: <5146@mit-eddie.UUCP>
Date: Fri, 30-Aug-85 00:16:52 EDT
Article-I.D.: mit-eddi.5146
Posted: Fri Aug 30 00:16:52 1985
Date-Received: Sun, 1-Sep-85 05:16:37 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 22

From: ucdla%ucbtopaz.CC@Berkeley

please add the following id to the packet radio mailing list

UCDLA%UCBTOPAZ.cc@BERKELEY.ARPA

this is the arpanet mailing address of the University of California
Division of Library Automation. We do computerized library systems

for the 9 UC campus system and are involved in several research
projects in volving packet radio

We are also interested in contacting people who have done work with
the Arizona tnc board. We run tcp/ip on out backbone network and
are looking to use the tnc board to create packet radio terminals that
would talk tcp/ip. we would be interested in hearing from anyone who
has converted the ax.25 protocol on the board into a datagram interface
suitable for talking to some of the pc based tcp systems or anyone
who might be able to help us do so. we can be contacted at the above
internet mail address

Mark Needleman
Principal Systems Programmer

From 3737178727470923868
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5eda7eec323e634f,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-29 21:59:08 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!
Murray.pa@Xerox.ARPA
From: Murray.pa@Xerox.ARPA
Newsgroups: net.ham-radio.packet
Subject: High-speed modems
Message-ID: <5147@mit-eddie.UUCP>
Date: Fri, 30-Aug-85 00:59:08 EDT
Article-I.D.: mit-eddi.5147
Posted: Fri Aug 30 00:59:08 1985
Date-Received: Sun, 1-Sep-85 05:16:54 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 13

From: Murray.pa@Xerox.ARPA
From Michael Chepponis: "High-speed" here means 56 kb/sec, because that
is the maximum rate allowed on 220 and 440 bands; really high-speed
stuff will have to be on 1240 MHz.

Can somebody explain the reason for that constraint? (I know that
"reason" and regulations frequently don't make sense.)

I'd expect that the restriction would be on bandwidth rather than bit
rate, and Shannon tells us that the signal/noise ratio as well as the
bandwidth is what actually constrains the bit rate. Are there some
theoretical limits on S/N that I've missed? (Like max output power and
receiver front end thermal noise?)

From -422097003438257890

X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,1a716540cf9bb245,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-29 23:37:59 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!karn@mouton
From: karn@mouton
Newsgroups: net.ham-radio.packet
Subject: High Speed Modems
Message-ID: <5149@mit-eddie.UUCP>
Date: Fri, 30-Aug-85 02:37:59 EDT
Article-I.D.: mit-eddi.5149
Posted: Fri Aug 30 02:37:59 1985
Date-Received: Sun, 1-Sep-85 05:17:36 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 39

From: karn@mouton (Phil R. Karn)
It all depends on which section of 97.69 ("Digital Communications") you choose to operate under. If you're operating internationally, then the code and speed limits of paragraph "a" apply (300 baud below 28 Mhz; 1200 baud between 28 and 50 Mhz; 19.6 kilobaud [sic] between 50 and 220 Mhz; 56 kilobaud about 220 Mhz.) You must use Baudot, ASCII or AMTOR under this part. Everybody assumes that AX.25 is okay, since we're sending ASCII characters in our synchronous, bit stuffed HDLC frames. We haven't pressed this point, and nobody has complained.

If you're operating on a domestic path, you qualify for paragraph "c", authorizing the use of "any digital code" above 50 MHz subject only to the following bandwidth restrictions: 50-220 Mhz: 20 Khz; 220-1240 MHz: 100 kHz; 1240 Mhz and up: unlimited. Bit and baud rates are left completely unspecified, although it is impossible to signal at a baud rate greater than twice the bandwidth without intersymbol interference.

I guess the Commission set up these two separate sections because they didn't feel that they had the authority to allow the use of "nonstandard codes" on international QSO's. Yes, there are lots of contradictions and unnecessary complications in this section, but we're a lot better off with it than without.

Note that the speed limits in paragraph a are specified in BAUD, not bits/sec. When they put out their NPRM, the FCC proposed to change "baud" to "bits/sec", thinking that it didn't make any difference. A number of us pointed out the distinction in our comments, with the result that the wording (i.e., "baud") was left unchanged. This means that even over HF you can experiment with multi-level modulation and run any bit rate you desire, assuming you have the necessary signal-to-noise ratio and stay within the baud rate limits (which, as mentioned above, determine the bandwidth anyway.)

The vast majority of packeteers run domestic links, so anything goes as long as it's above 50 MHz, fits within the allowable bandwidths, and doesn't

involve deliberate encryption. You don't have to worry at all about baud rates (i.e., paragraph "a") unless you operate packet on HF, or internationally (over Oscar-10 or across a nearby border).

Phil

From 136126318655761863
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,267d36b6d476b137
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-30 00:09:07 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!
F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
From: F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
Newsgroups: net.ham-radio.packet
Subject: Re: Pressing Issues for Packet Radio Development
Message-ID: <5150@mit-eddie.UUCP>
Date: Fri, 30-Aug-85 03:09:07 EDT
Article-I.D.: mit-eddi.5150
Posted: Fri Aug 30 03:09:07 1985
Date-Received: Sun, 1-Sep-85 05:17:54 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 18

From: F33PAP%DHHDESY3.BITNET@WISCVM.ARPA
> ... should be done vs the other. They are:
>
> 1) Develop a small, cheap, yet flexible TNC which does AX.25.
> I believe a z80 system with just 5 other chips could do it; so
> far, total parts/board/power costs are about $30.

Here in Hamburg we try to design a TNC which may fit into this. It is based on a Z80 using a 8530SCC as serial interface (it does all you need for HDLC protocol) and 7911 world modem chip (to be able to switch to 300 Bd for HF). Total estimated cost is about DM 200 (abt 67$). The board is a 10 by 16 cm "EURO"-board with a 31 or 64 pin connector (not decided yet).

As part of this project we would like to have some software info. If anybody has got the source code for the TAPR TNC this would really help us with the "protocol hacking".

Karl-Heinz DK8HI BITNET: F33PAP at DHHDESY3
ARPA: F33PAP%DHHDESY3.BITNET@WISCVM.ARPA

From -5538894944507040100
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,36500a1274ccd02a,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-08-30 20:03:25 PST

Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!
KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: TAPR TNC2 Hints 'n Kinks
Message-ID: <5160@mit-eddie.UUCP>
Date: Fri, 30-Aug-85 23:03:25 EDT
Article-I.D.: mit-eddi.5160
Posted: Fri Aug 30 23:03:25 1985
Date-Received: Sun, 1-Sep-85 05:18:48 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 68

From: Keith Petersen <W8SDZ@SIMTEL20.ARPA>
This is relayed from a local packet machine:

Posted: Sun Aug 25, 1985   6:00 AM GMT Msg: OGIF-2241-3677
From: TCLARK
To: docs
Subj: TAPR TNC2 Hints 'n Kinks

Now that many of you have TNC2's coming, here are a few minor things you might want to watch out for:

(1) I'm not sure if the artwork got fixed for the "production" run, but on the "beta" test boards, there is one trace error. On the DB25 RS-232 connector, there is a trace on the back side going to pin 16. It should be going to pin 6. An easy way to fix it is to cut the trace to pin 16 on the back side, and then run a small jumper wire from the plated-thru hole near the DIP switch to pin 6.

(2) If you have trouble in the demod calibration exercise, the problem may be with noisy transitions from U8 [U8 is use ONLY in the calibration steps, not in normal operation]. I found that a 0.1 bypass between pins 3 & 4 helped a lot.

(3) Unless you use all CMOS parts, the 7805 regulator runs a bit warmer than I'd like to see. In later versions of the TNC2 board, the regulator will bolt to one of the top rails in the cabinet. For the first batch of boards, I'd suggest the following modification to improve the heat conduction from the 7805 to the aluminum cabinet:
   a. Drill a small hole (to clear the 4-40 or 6-32 screw in step b.) in the bottom of the case to line up with the mounting screw for the 7805 regulator. this should be 1.32" from the front lip of the case and 0.55" from the side of the case.
   b. Find some 4-40 or 6-32 threaded (preferably aluminum) spacers and cut off a 0.30" piece. Use this threaded spacer as the mounting nut for the 7805 on the back side of the board with a short screw going thru the tab on the top side of the board. After you slide the board into the cabinet, use a second short screw to "bond" the

spacer to the cabinet.

(4) Also on the topic of heat control, I'd advise mounting R80 "in the air" about 0.3" above the board. On my board, the leads are at about the same height above the board as are the leads on the adjacent C12 electrolytic capacitor.

(5) Since N2WX added in the time-of-day clock software, the frequency accuracy of the xtal oscillator is more critical. I'd suggest putting a small 10-50 pf trimmer capacitor in C47 in lieu of the 22 pf "blue" capacitor provided with the kit.

(6) Keep the leads to the electrolytic capacitors C3, C6, C7, C8, C10, C16 and C18 as short as possible, or you may have trouble with them hitting the rails on the top of the aluminum cabinet.

(7) Although headers are (probably) not provided, JMP1 will be necessary if you try to use hardware handshaking (e.g. on a W0RLI BBS). I'd also suggest installing JMP3 header -- the plated-thru hole on the trace going to the + end of C12 carries a lot of current and is a potential "fuse"; the JMP3 header will insure a positive jumper between the top and bottom of the board.

(8) Be very careful to trim the tabs on the top of the push-button switch and power connector or else they can short to the rails on the top of the case.

(9) I have a mod that gives a PTT indication by changing the intensity of the power LED. Is anybody interested?

73, Tom

From -3591183455175788287
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6f49f89f18f684c5,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-01 08:57:37 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!decvax!genrad!mit-eddie!KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: X.PC protocol description available
Message-ID: <5168@mit-eddie.UUCP>
Date: Sun, 1-Sep-85 11:57:37 EDT
Article-I.D.: mit-eddi.5168
Posted: Sun Sep 1 11:57:37 1985
Date-Received: Mon, 2-Sep-85 09:02:30 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 40

From: Keith Petersen <W8SDZ@SIMTEL20.ARPA>
Now available via anonymous FTP from SIMTEL20:

```
     Filename      Type  Bytes    CRC

Directory MICRO:<CPM.MODEM>
     X-PC.DOC.1         ASCII    127850  34DFH
     X-PC.DQC.2         BINARY    77056  CA2CH <-same, squeezed
```

[Keith: which MAY be the same as TYMNET offers as:]

Now available from your local Tymnet sales representative:

X.PC PROTOCOL SPECIFICATIONS NPD-269 $3.00

This specification is published by McDonnell Douglas as a proposal to designers and implementors of personal computer communications software and packet network systems.

It defines the formats and procedures at X.PC's packet and data line layers for Data Terminal Equipment (DTE) and Data Communications Equipment (DCE). Both switched virtual call and permanent virtualy call modes of operation are defined.

This specification covers DTE and DCE operation when a packet switched network is accessed through a circuit switched or dedicated connection. It also includes the additional packet layer procedures necessary for two DTEs to communicate directly (i.e., without an intervening packet switched network) over dedicated or circuit switched connection.

[Keith: this is the much-talked-about "error-free terminal protocol" now supported by TYMNET. It is an interesting alternative to MICROCOM's "MNP" protocol which you must buy a new modem to get (and which requires the "other end" to also have this type modem). If we could get BBN to support the X.PC protocol in the TAC software, we could have error-free sessions in spite of occasional noise on the phone lines.]

--Keith

From -1290108445414140024
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f4af7dce329e0f35,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-02 09:31:59 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!bellcore!
decvax!genrad!panda!talcott!harvard!think!mit-eddie!KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet

Subject: W0RLI MailBox/GateWay v 10.0
Message-ID: <5177@mit-eddie.UUCP>
Date: Mon, 2-Sep-85 12:31:59 EDT
Article-I.D.: mit-eddi.5177
Posted: Mon Sep 2 12:31:59 1985
Date-Received: Wed, 4-Sep-85 06:13:10 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 97

From: CLEMENTS@BBNG.ARPA
Version 10.0 of the W0RLI MailBox/Gateway has been released. The
sources and binaries have been posted to SIMTEL20, and are also
available on disk from the author.

Filename   Type Bytes   CRC

SIMTEL20 directory MICRO:<CPM.PACKET>
PACKT100.LBR.1   BINARY   275584 5E49H

The changes since the last such posting, version 9.3, are summarized
below in an extract from the NOTES.TNC file.

For those who have not seen this system before, a brief description:

The W0RLI MailBox and GateWay is a system which runs on a Xerox 820
computer and which operates on Amateur Packet Radio via one or two
TAPR TNCs (or clones). It also runs with TNC-2s (W3IWI is running one).

The W0RLI system is running at over 75 sites in some number of
countries and makes up the majority of the packet mail forwarding
system. It is also used for gatewaying between local packet areas and
long haul links on HF, or to nearby nets on other VHF/UHF bands.
For a more complete description, see NOTES.TNC.

Hank is not on ARPANET or Usenet. I will be glad to relay comments
and questions to him. If you want the distribution on disk, send
a self-addressed stamped 8" SSSD disk (in re-usable mailer) to Hank at
his callbook address. Two disks if you want the sources as well.
To reduce the load on Hank, I will do the same under the same conditions.
I am also good in the Callbook.

73,
Bob, K1BC

ARPANET: CLEMENTS@BBN
Usenet: {ihnp4, decvax, linus, ...}!bbncca!clements

[Extract of NOTES.TNC follows]

     W0RLI MailBox and GateWay   Version 10.0

Changes and additions since version 9.9 are:

Added Exclude user if has illegal call.
Added Exclude user by # digipeaters used.
Added TO call and first 32 chars of title to log on S.
Added @ BBS to M command.
L@ - List msgs @ BBS added.
File names in config.tnc: user.dat, mail.dat, msg.tmp
GateWay YES/NO on local menu.
Better handling of connects using user file.
Commands to send to tnc for state changes in config.tnc.
Cleaned up user login code, bug with linked user privelege.
Added Sx AAA [@ BBB] [< CCC] (and all varients).

Changes and additions since version 9.8 are:

Cleanup gateway connect init code.
Add $J, $K, $M, $P
Store most recent SSID in user record. Use for connects.
MON.TNC specified in config.tnc.
Store null path in user record if user connects direct and
record HAD a path.

Changes and additions since version 9.7 are:

GateWay connect checks user.dat for path.
DU lists from most recent.
F did not pick up msg #
Added date/time stamp to end of MON.TNC, write it periodically

Changes and additions since version 9.5 are:

D/U/O did not pick up argument. (9.6 and 9.7).
E <msgnr>, blanked file title (9.6 only).
J lists now saved in file MON.TNC.
Fixed broken KT. (9.6 only?).
Removed the YES/NO for "connect with owners call" from config.tnc,
it is handled by the owners user record.
Clean up of code, minor bug fixes.
Upper/lower case ok in fwd.tnc
Change to z80 mnemonics.

Changes and additions since version 9.3 are:

Changed forward priority, AT bbs used if there, TO call if not.
Current msg # updated to correct number after GR.
Fixed spurious connect during forwarding.
Added edit of 'AT BBS' to edit message header.
Fix of bug, lost correct call if msg entered after force fwd.
Fix to untangle - long message it fails.
Fixed broken remote sysop mode.

[End of extract]

From 553843321179376114
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,b15cf55084d40843,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-02 14:06:55 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site pur-ee.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!inuxc!pur-ee!kk9w
From: kk9w@pur-ee.UUCP (David Andersen)
Newsgroups: net.ham-radio.packet
Subject: TNC2 Question on Hardware
Message-ID: <3250@pur-ee.UUCP>
Date: Mon, 2-Sep-85 17:06:55 EDT
Article-I.D.: pur-ee.3250
Posted: Mon Sep 2 17:06:55 1985
Date-Received: Wed, 4-Sep-85 04:46:45 EDT
Organization: Electrical Engineering Department , Purdue University
Lines: 42

UB 40

Well, my TNC2 arrived last wednesday, and over the long weekend,
I spent some time putting it together. Copies the packet
traffic over our local digipeaters and bulletin boards just fine.
However, it won't key my transmitter, so I can't talk back.

The transmitter (IC 290H) works fine when you short the PTT
line (pin 5 of mic connector) to ground with the hand held mic,
screwdriver, or whatever. However, when I hook up the tnc2
to the mic connector, it doesn't work.

Q10 of the tnc2 is the switching fet that is supposed to key
the transmitter. The directions said to make sure that is
switching properly. The voltage in receive mode is about 13.4V
(just down from the ps voltage) and in transmit mode is
less than 0.25V, but definitely not zero.

What actually happens is that the transmit led lights up
on the radio when it is keyed by the tnc2, but no output
power is forthcoming. My radio manual says to check the PTT
connections when that happens.

Anyway, my conjecture is that Q10 is not saturating hard enough
to pull the PTT voltage down to a sufficient level. Somebody
around here suggested I substitute a 2n3904 for the fet and
see if that wont saturate better. I though that was logical,
but lots of 2n3904 transistors are used in the tnc2, so why
did they get a special one for this switch? Am I still
missing something crucial? Did I screw the thing up when I
built it or is the 290H just a particularly finicky radio

when it comes to PTT switching (it works fine with a tnc1)?

Any help you guys would have to offer (gals too, dont want
to be sexist) would be much appreciated. I understand some
TAPR guys are on this net. Do you have any good reason
why a 2n3904 wouldnt work? Do you have any suggestions?
Has TNC2 worked successfully with a 290H before?

Thanks in advance for your suggestions.

Dave, kk9w

From -5446572927006678815
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,de76676db725ad4e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-02 19:36:01 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!bellcore!
decvax!genrad!mit-eddie!KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: WA8DED v 0.91 firmware for TAPR TNC-1 available
Message-ID: <5181@mit-eddie.UUCP>
Date: Mon, 2-Sep-85 22:36:01 EDT
Article-I.D.: mit-eddi.5181
Posted: Mon Sep 2 22:36:01 1985
Date-Received: Wed, 4-Sep-85 06:00:13 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 104

From: Bob Clements <clements@bbnccq.ARPA>
This message announces the posting of version 0.91 of the WA8DED
firmware for the TAPR TNC-1. It has been posted on SIMTEL20 on the
ARPANET. Some Usenet guru will have to carry on from there for the
usenet folks.

The files are available from SIMTEL20 as:
Filename   Type Bytes   CRC

Directory MICRO:<CPM.PACKET>
TNCDED.DOC.1   ASCII   30130 CF05H
TNCDED.HEX.2   ASCII   46093 9F06H
TNCDED.MSG.1   ASCII   4211 3D8CH

This firmware runs on the TAPR TNC-1 and its clones, the AEA and the
Heath HD-4040 TNCs. It is NOT an upgrade of the TAPR code. It is
a completely new implementation of the AX.25 protocol, both the
current version 2.0 and the older 1.x version supported by the normal
TAPR code. It also supports up to four simultaneously open connections

on one TNC. And it has a "host friendly" mode, which is intended to simplify the interfacing of the TNC to a Bulletin Board or other computer system. It has noticeably fewer protocol bugs than the TAPR code, and a much more informative Monitor mode.

The command interface is NOT the same as the TAPR TNC code. It is therefore not just an improvement for your TNC, but a complete change of the interface. So you might not want it if you (or your computer) are used to the standard interface.

The files posted are: This message, TNCDED.MSG; The documentation file, TNCDED.DOC; and the binary of the code itself, in Intel Hex format, in TNCDED.HEX.

The code occupies two 2764 EPROMs (actually about 1.2 EPROMs - plenty of space left in the second one). The EPROMs reside at C000 and E000 of the TNC, sockets U11 and U12 respectively. If you need to manipulate this file with a CP/M DDT, remember to use an offset with the I command so that you don't overwrite your DDT, BDOS and BIOS. Put C000 through DFFF into the EPROM for U11, and put E000 through FFFF into the EPROM for U12.

The code and documentation are copyrighted 1985 by Ronald Raikes, WA8DED. They are submitted with his permission for non-commercial use by individual Radio Amateurs. All other rights reserved by Ronald Raikes.

The program is written in 6809 assembler. The source code is not being posted, but is available from Ron by sending him an 8" SSSD CP/M format disk in a reusable mailer with return postage. Enclose a letter agreeing to the above personal use restriction. To ease the load on Ron, I will also make copies under the same ground rules.

When I talked to him today, he sounded somewhat overwhelmed by the number of people contacting him about getting copies of the ROMs. I hope that by posting them here I will reduce that load on him, not increase it. Please use your discretion before adding to the crowd of people contacting him. But if you have to, ...

You can reach Ron by packet through the forwarding mailbox network. Address him as WA8DED @ KD6SQ. He is not on ARPANET or Usenet. His US mail address is:

> Ronald Raikes, WA8DED
> 9211 Pico Vista Road
> Downey, CA 90240

If you want to mail me a disk, as offered above, I'm good in the callbook.

73,
Bob, K1BC

ARPANET: CLEMENTS@BBN
Usenet: {ihnp4, decvax, linus}!bbncca!clements
Amateur Packet Radio BBS net: K1BC @ K1BC, via W0RLI

[Political statement: Boycott the TNC-2 until a maintenance release
of TNC-1 comes out!]

[Usual disclaimers and trademark notices]

The following message ported from the WA6OSA Packet Mailbox:

*** Message from WA6OSA to ALL entered Thursday 01-Aug-85 at 8:45 PM
*** Subject: ++NEW IMPROVED++ WA8DED FIRMWARE FEATURES

Version 0.9 of the WA8DED firmware for the TAPR TNC-1 compatables is
now available. It is written in 6809 assembly language and is
contained in two 2764 EPROMs. Some of its outstanding features are:

1. Up to four simultaneous connects (plus unproto).
2. Easy to read 'monitor' frame information in unproto mode.
3. Simple 'On Screen' Calibration.
4. Digipeats version 2 protocol.
5. Meaningful channel status display (separate status for each channel).
6. Supports modem baud rates up to 9600 baud.
7. New-Improved Host Mode (for computer interface).
8. Display of link state and number of free buffers.
9. XON-XOFF flow control
10.Auto-Unattended/Beacon Mode.

Version 1.0 should be available around the first of September and is
contained in two 2764 EPROMS. The W6IXU mailbox is currently using a
beta version 0.9 of the WA8DED firmware.

From 1948666905623125578
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d42ff64f4e1ee714,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-03 04:30:08 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!bellcore!
decvax!genrad!mit-eddie!KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: WA8DED v 0.9 TAPR code
Message-ID: <5185@mit-eddie.UUCP>
Date: Tue, 3-Sep-85 07:30:08 EDT
Article-I.D.: mit-eddi.5185
Posted: Tue Sep 3 07:30:08 1985
Date-Received: Thu, 5-Sep-85 01:01:34 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA

Lines: 8

From: CLEMENTS@BBNG.ARPA
I have been running with the new WA8DED v 0.9 TAPR code in one of my
TNCs for a couple days. It is amazing to watch all the protocol
errors being committed by the original TAPR code. Easy to see with
the improved monitor mode of WA8DED's stuff.

73,
/Rcc

From 2971262286552516872
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6f49f89f18f684c5
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-04 15:23:40 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!sun!l5!
sunny@Berkeley
From: sunny%Berkeley@l5.UUCP
Newsgroups: net.ham-radio.packet
Subject: Re: X.PC protocol description available
Message-ID: <5200@mit-eddie.UUCP>
Date: Wed, 4-Sep-85 18:23:40 EDT
Article-I.D.: mit-eddi.5200
Posted: Wed Sep 4 18:23:40 1985
Date-Received: Fri, 6-Sep-85 03:31:36 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 4

From: sun!l5!sunny@Berkeley (Ms. Sunny Kirsten)
Please correct my mailing address to ...{ucbvax,decvax,ihnp4}!sun!l5!sunny

                  Sunny, KA6PPP

From 4965907844203288777
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,80853e383cbaff79,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-04 20:21:02 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: WA8DED code
Message-ID: <517@petrus.UUCP>
Date: Wed, 4-Sep-85 23:21:02 EDT
Article-I.D.: petrus.517

Posted: Wed Sep 4 23:21:02 1985
Date-Received: Thu, 5-Sep-85 10:38:18 EDT
Distribution: net
Organization: Bell Communications Research, Inc
Lines: 7

Does anybody know if the WA8DED code will run on an old TAPR-1 "Beta"
board? If not, can somebody talk the author into recompiling it for
the Beta board?

Thanks,

Phil Karn

From 5626825049089044686
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e4409aa18c26bc46,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-05 08:27:56 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site burl.UUCP
Path: utzoo!watmath!clyde!burl!ars
From: ars@burl.UUCP (ars)
Newsgroups: net.ham-radio.packet
Subject: TNC SOFTWARE
Message-ID: <848@burl.UUCP>
Date: Thu, 5-Sep-85 11:27:56 EDT
Article-I.D.: burl.848
Posted: Thu Sep 5 11:27:56 1985
Date-Received: Fri, 6-Sep-85 03:32:51 EDT
Distribution: net
Organization: AT&T Technologies, Burlington NC
Lines: 14

I purchased some surplus STD BUS development systems from the
company I work for a couple of years ago. Included, among other
things, are a Z-80 CPU board, 2 Serial interface ports, 2 parallel
ports, and several memory boards which can contain EPROMS or SRAMS.

I think these units could readily used as a terminal node
controller for packet radio. I know that several of these units
were purchased by members of AMRAD and am wandering if anyone has
already written the software to accomplish this.

If not is there anyone that could provide me any guidance. I
understand that the TAPR TNC-2 uses a Z-80 and was wandering if the
software for this unit, if available, could be modified to operate
with this system.

From 8419300215253970060
X-Google-Language: ENGLISH,ASCII-7-bit

X-Google-Thread: 11bd51,f21ee8201e7cc7db,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-05 20:17:21 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site pur-ee.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!inuxc!pur-ee!kk9w
From: kk9w@pur-ee.UUCP (David Andersen)
Newsgroups: net.ham-radio.packet
Subject: RE: TNC2 Hardware Question -- It works now
Message-ID: <3265@pur-ee.UUCP>
Date: Thu, 5-Sep-85 23:17:21 EDT
Article-I.D.: pur-ee.3265
Posted: Thu Sep 5 23:17:21 1985
Date-Received: Sat, 7-Sep-85 13:17:39 EDT
Organization: Electrical Engineering Department , Purdue University
Lines: 9

UB 40

To all of those who responded, thanks for your hints. I put
one of those DIP relays in between my tnc2 and radio, and that
solved the problem. It sure is fun to play with the thing!

73's

Dave, kk9w

From 1851489741645566045
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e4409aa18c26bc46
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-07 07:42:20 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!mit-eddie!burl!ars@mit-eddie.MIT.EDU
From: ars@mit-eddie.MIT.EDU
Newsgroups: net.ham-radio.packet
Subject: TNC SOFTWARE
Message-ID: <5250@mit-eddie.UUCP>
Date: Sat, 7-Sep-85 10:42:20 EDT
Article-I.D.: mit-eddi.5250
Posted: Sat Sep 7 10:42:20 1985
Date-Received: Mon, 9-Sep-85 01:26:17 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 15

From: ars <burl!ars@mit-eddie.MIT.EDU>
I purchased some surplus STD BUS development systems from the
company I work for a couple of years ago. Included, among other
things, are a Z-80 CPU board, 2 Serial interface ports, 2 parallel
ports, and several memory boards which can contain EPROMS or SRAMS.

I think these units could readily used as a terminal node
controller for packet radio. I know that several of these units
were purchased by members of AMRAD and am wandering if anyone has
already written the software to accomplish this.

If not is there anyone that could provide me any guidance. I
understand that the TAPR TNC-2 uses a Z-80 and was wandering if the
software for this unit, if available, could be modified to operate
with this system.

From 6521227090779752061
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,80853e383cbaff79
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-07 07:57:21 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!petrus!
karn@mit-eddie.MIT.EDU
From: karn@mit-eddie.MIT.EDU
Newsgroups: net.ham-radio.packet
Subject: WA8DED code
Message-ID: <5251@mit-eddie.UUCP>
Date: Sat, 7-Sep-85 10:57:21 EDT
Article-I.D.: mit-eddi.5251
Posted: Sat Sep 7 10:57:21 1985
Date-Received: Sun, 8-Sep-85 16:11:47 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 8

From: "Phil R. Karn" <petrus!karn@mit-eddie.MIT.EDU>
Does anybody know if the WA8DED code will run on an old TAPR-1 "Beta"
board? If not, can somebody talk the author into recompiling it for
the Beta board?

Thanks,

Phil Karn

From 8092563774164756796
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,80853e383cbaff79
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-07 08:31:38 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!mit-eddie!petrus!
karn@mit-eddie.MIT.EDU
From: karn@mit-eddie.MIT.EDU

Newsgroups: net.ham-radio.packet
Subject: WA8DED code
Message-ID: <5252@mit-eddie.UUCP>
Date: Sat, 7-Sep-85 11:31:38 EDT
Article-I.D.: mit-eddi.5252
Posted: Sat Sep 7 11:31:38 1985
Date-Received: Mon, 9-Sep-85 01:45:49 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 8

From: "Phil R. Karn" <petrus!karn@mit-eddie.MIT.EDU>
Does anybody know if the WA8DED code will run on an old TAPR-1 "Beta"
board? If not, can somebody talk the author into recompiling it for
the Beta board?

Thanks,

Phil Karn

From -2642394187268249964
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e4409aa18c26bc46
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-07 08:32:12 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!mit-eddie!burl!ars@mit-eddie.MIT.EDU
From: ars@mit-eddie.MIT.EDU
Newsgroups: net.ham-radio.packet
Subject: TNC SOFTWARE
Message-ID: <5253@mit-eddie.UUCP>
Date: Sat, 7-Sep-85 11:32:12 EDT
Article-I.D.: mit-eddi.5253
Posted: Sat Sep 7 11:32:12 1985
Date-Received: Mon, 9-Sep-85 01:47:37 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 15

From: ars <burl!ars@mit-eddie.MIT.EDU>
I purchased some surplus STD BUS development systems from the
company I work for a couple of years ago. Included, among other
things, are a Z-80 CPU board, 2 Serial interface ports, 2 parallel
ports, and several memory boards which can contain EPROMS or SRAMS.

I think these units could readily used as a terminal node
controller for packet radio. I know that several of these units
were purchased by members of AMRAD and am wandering if anyone has
already written the software to accomplish this.

If not is there anyone that could provide me any guidance. I

understand that the TAPR TNC-2 uses a Z-80 and was wandering if the
software for this unit, if available, could be modified to operate
with this system.

From 4349434873431392815
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,79f76c2970b252d0,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-08 21:22:08 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!mit-eddie!CLEMENTS@BBNG.ARPA
From: CLEMENTS@BBNG.ARPA
Newsgroups: net.ham-radio.packet
Subject: Foolishness
Message-ID: <5262@mit-eddie.UUCP>
Date: Mon, 9-Sep-85 00:22:08 EDT
Article-I.D.: mit-eddi.5262
Posted: Mon Sep 9 00:22:08 1985
Date-Received: Tue, 10-Sep-85 03:29:07 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 27

From: CLEMENTS@BBNG.ARPA
The following message is relayed from the K1BC PBBS:

This msg is being filed by the following route:
A terminal at K1BC-1 talking to a TNC-1 with WA8DED code in it;
K1BC-1 sending on 223.10 MHz;
Being relayed by K1BC/R audio repeater at Weston MA;
to W0RLI-1 on 224.70;
Gatewaying at W0RLI-1 to 145.01 MHz ;
Digipeating via K1EA Harvard MA;
to N1DL in Sudbury;
Gatewaying from 145.01 to 14.103 MHz at N1DL;
From N1DL to W0RLI-0 on 14.103;
Gatewaying at W0RLI-0 back to 145.01 MHz;
From w0rli-0 via KD2S-1 Digipeater in Lowell MA;
to K1BC-0 BBS in Lexington MA, or about 3 feet from where I am typing this.

So:
3 bands (220, 145 and 14 MHz)
10 TNC's (I think)
3 Gateways
and a BBS.

Hooray!   The Network Grows!

73,   de Bob, K1BC

From 926214326747797352
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6d9005c32ad24fc1,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-09 06:14:08 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!drutx!mtuxo!mtunh!ky2d-2!ad7i
From: ad7i@ky2d-2.UUCP (Paul)
Newsgroups: net.ham-radio.packet
Subject: TNC2 PTT operation
Message-ID: <35@ky2d-2.UUCP>
Date: Mon, 9-Sep-85 09:14:08 EDT
Article-I.D.: ky2d-2.35
Posted: Mon Sep 9 09:14:08 1985
Date-Received: Tue, 10-Sep-85 05:15:07 EDT
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 39

David Anderson:
David -- i am posting this to the net because it might be
of interest to others in addition to just yourself.

The PTT circuits of both TNC1 and TNC2 are almost exactly alike.
I think the only difference is the operating voltage (that might
be the key) and a bypass cap. Given that the PTT voltage, when
you want the transmitter on, is less that 0.5 volts, it sounds to
me like your radio should be keyed up (radio designers don't think
much of my opinion, however).
The problem is that most PTT lines think they are talking to a contact
switch on a microphone -- not a BJT or FET. So, radio designers to
silly things like have the microphone switch short a common emitter
transistor's base to ground to have the radio transmit. That works
well for mechanical switches on microphones but not always for electronic
switches. (I am guessing at this point at the type of PTT switching
inside your radio).

Yes, it would be nice if the TNC2 could switch your radio's PTT but
given that it is not, here are some things to try. I offer several in
hopes that at least one will be useful for you.

1) modify your radio so the when the PTT lead is less than 3 volts
    the transmitter will come on. (probably not practical)

2) add a relay either internal or external to TNC2 so that a metallic
    contact is provided to switch the PTT lead of your radio

3) try to hand select FETs that have lower saturation voltages.

4) try two 2n3904s in a darlington configuration and remember to add

    a base resistor to limit the base current (try 10K).

I hope one of these ideas strikes your fancy and that it works for
you. Please let me know how it turns out.

73, paul ..!ihnp4!hou2h!ad7i (one of the HW developers of TNC2)

From -7875810045207322564
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,8068f298e4173696,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-09 12:07:52 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!mit-eddie!nac960@nems
From: nac960@nems
Newsgroups: net.ham-radio.packet
Subject: Additions To The List Of W0RLI BBS Stations
Message-ID: <5267@mit-eddie.UUCP>
Date: Mon, 9-Sep-85 15:07:52 EDT
Article-I.D.: mit-eddi.5267
Posted: Mon Sep 9 15:07:52 1985
Date-Received: Tue, 10-Sep-85 05:11:59 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 32

From: Jim Brining <nac960@nems>
There are a number of W0RLI BBS's in Illinois and Indiana that are linked by
automatic forwarding. Autoforwarding takes place on a nightly basis. The
frequency currently used in Central Illinois and Central Indiana is 147.555.

W0RLI BBS'S LINKED BY AUTOFORWARDING

WB9MJN   NAPERVILLE,   ILL   W0RLI BBS   (SOUTHWEST CHICAGO SUBURB)
K9JA   CHAMPAIGN ,   ILL   W0RLI BBS
WA9WQS   ANDERSON ,   IND   W0RLI BBS   (JUST NORTHEAST OF INDIANAPOLIS)
WA8EJH-2   BLOOMINGTON, IND   W0RLI "CLONE" (VAX 11/780 BASED AT INDIANA UNIV)

OTHER BBS'S NOT ON LIST

There is a new W0RLI BBS in Ohio. Currently no autoforwards take place on VHF.
WB8WGA   GHANNA,   OH   W0RLI BBS   (COLUMBUS SUBURB .... HF GATEWAY)

UNDER TEST (NOT ACTIVE FULL TIME)

N9CZV   W LAFAYETTE, IND   W0RLI BBS   (PURDUE UNIVERSITY)

W0RLI BBS'S BEING PLANNED:

STERLING, ILL.
ST LOUIS, MO

73'S de Dave, W9ZRX APRPANET ADDRESS .... JMB7 "at" NEMS

From 3485371941534874788
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9b0b139105fa197f,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-09 12:20:18 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10 beta 3/9/83; site sri-unix.ARPA
Path: utzoo!linus!decvax!decwrl!Glacier!oliveb!hplabs!sri-unix!larson
From: larson@sri-unix.ARPA (Alan Larson)
Newsgroups: net.ham-radio.packet
Subject: ax.25 version 2
Message-ID: <193@sri-unix.ARPA>
Date: Mon, 9-Sep-85 15:20:18 EDT
Article-I.D.: sri-unix.193
Posted: Mon Sep 9 15:20:18 1985
Date-Received: Thu, 12-Sep-85 23:18:03 EDT
Organization: SRI, Menlo Park, CA.
Lines: 7

I have heard of a 'new improved' version of the ax.25 protocol.
While I don't know what was 'wrong' with the old one, I would
like to find a machine-readable version of the specification
for the new one. Does anyone know if such exists?
     Thanks,
     Alan
     wa6azp

From -7581522921962991425
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,77e22283f1bd80fc,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-11 10:12:10 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!bonnie!akgua!whuxlm!harpo!decvax!genrad!mit-eddie!
clements@bbnccq
From: clements@bbnccq
Newsgroups: net.ham-radio.packet
Subject: Re: questions on W0RLI mailbox and gateway
Message-ID: <5286@mit-eddie.UUCP>
Date: Wed, 11-Sep-85 13:12:10 EDT
Article-I.D.: mit-eddi.5286
Posted: Wed Sep 11 13:12:10 1985

Date-Received: Fri, 13-Sep-85 04:13:28 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 144

From: Bob Clements <clements@bbnccq.ARPA>
Hi, Steve,

First: Do I believe this? BITNET and UUCP to ARPANET by way of Berkeley in only 3 minutes? Far out!

> Received: from BBNA.ARPA by BBNCCQ ; 11 Sep 85 10:03:47 EDT
> Date: Wed, 11 Sep 85 10:00:24 edt

Well, let me see if I can answer some of your questions. I'll CC this to the packet mailing list, in case anyone else can make use of the info, or wants to add better answers.

> I have seen some of these systems referred to as bulletin boards. Does
> that mean that notes of local interest can be posted and made available
> for all to see?

There are other systems than the W0RLI ones, so answers for them may be different. But for the W0RLI systems:

There are three main functions: Mail handling, File handling, and Gatewaying.

Mail consists of short messages from one Amateur to another or to the National Traffic System (NTS) or to an address such as "ALL" or "NEPRA" or "GLBERS" or whatever. Mail can be automatically forwarded from one PBBS to another. Commands for mail messages allow you to send it, read it, kill it, and list messages by various categories.

File handling commands allow text files to be uploaded and downloaded, and directory listings to be made. Files are standard CP/M-80 files. These are typically network maps, flea market listings, new user info, hints and kinks, short BASIC programs, etc. They are not automatically forwarded among PBBSs.

Gateway operation connects two RF paths. Typically one is on two meters and the other is on 20 or 30 or 40 meters. In some cases, the two paths are on two different VHF/UHF bands, and there are some that go between two different two meter frequencies. This latter case gets into a long discussion of congestion control which I won't go into here. The common case of HF gatewaying allows a local 2 meter user to talk to hams in other parts of the country by using the gateway station's HF gear. It also is used by the mailbox itself for forwarding mail to distant areas.

> Logging in was mentioned in the list of updates. Do

> users need accounts to use the system or is the login merely to identify
> who the current user of the system is?

  Logging of all activity is done for record keeping, analyzing the
  network performance and general interest. No "login" is required by
  the users.

> Can more than one person use the system at a time?

  The system was built on the TAPR TNC-1 which only allows one connection
  at a time. The WA8DED replacement code for the TNC-1, and the TNC-2
  allow multiple connections at once. Hank is thinking about allowing
  more than one connect at a time, but it would be a huge rewrite. We
  are considering whether it might be better to put this off until the code
  is moved to a new hardware base, such as a cheap IBM PC clone. In any
  case, it isn't here yet and won't be for a while.

> I have several questions about mail forwarding. Does the complete
> address of the recepient need to be specified or does the system have some
> type of routing table?

  The system has a routing table. It is typically not a complete list of
  all the packeteers in the world. That would be huge. In practice,
  it includes all the known mailboxes in the world, plus the users of
  "nearby" mailboxes. Users can send messages to "W6XYZ @ KD6SQ",
  for example. I probably don't have W6XYZ in my list, but I do have
  KD6SQ. I get a lot of traffic for K1OJH, president of NEPRA, so I
  have K1OJH at W0RLI in my table, because my users are likely to
  forget to include the "@ W0RLI" when they send mail to K1OJH.

> What are the advantages of sending mail via
> autoforwarding vs. digipeating the message to the closest mailbox to the
> destination?

  Digipeating a long distance is a bad idea in general. The reason is that
  the probability of any given packet failing to get to the other end
  deteriorates exponentially with the number of digipeaters. This leads
  to many retransmissions, wasting channel capacity. There is no
  hop-by-hop retransmission and acknowledgement when using digipeaters.
  Using the forwarding of PBBSs, each PBBS along the way gets acknowledgement
  of the packets and of the message. It can also retry from time to time,
  thus allowing forwarding through a path that is not open 24 hours a day.
  In fact the entire path may never have been available all at once. All
  that is needed if for each piece to be available sometime.

> Does the mailbox hold mail for anyone or just those
> known to the system?

  Actually, the algorithm is the inverse of this. It forwards all mail
  that it knows how to forward. If it has no path in the routing
  table for a message, that message stays where it is.

> I would also be interested in seeing a transcript of a session with a

> W0RLI system if you have the capability to capture text.

  Sorry, I don't have an easy way to do that from here. The commands
  were described above. In addition, when you first sign on, it greets
  you and tells you of any new mail addressed to you.

> I appreciate any information you could provide. There is some interest
> in packet in this area (Central Penna.) but no activity that I know of.
> I am trying to convince a club here to put up a mailbox system or at
> least a digipeater. The more I know about the capabilities of the W0RLI
> system, the better my case for installing one will be.

  Great! Do it! Pat the Nittany lion for me. I used to live in Boalsburg
  when I was a wee tad.

> Finally, I have read somewhere that there was a packet group forming in
> the Eastern Penna./MD/DEL area to coordinate networks -- or something
> along those lines. I can't find the reference to it anymore. Do you
> know what group I'm talking about? If so, do you know how I can get in
> touch with someone in that group?

  I'm not sure exactly which group this is. I know AMRAD is involved in
  that sort of thing. Also, the Gateway newsletter from ARRL carries news
  of that sort. Gateway is sometimes posted to this net. (Personally, I
  refuse to subscribe to Gateway and QEX. I believe the info belongs in
  QST where it will benefit the hobby by wide exposure. The fragmentation
  that the ARRL is doing by making all these "newsletters" instead of making
  them columns in QST is harming our hobby. But that's another soapbox.)

> 73,
> Steve Fine
> UUCP: allegra|ihnp4|akgua !psuvax1!gondor!fine
> ARPANET: fine%psuvaxg.bitnet@wiscvm.arpa

73, Bob Clements, K1BC

UUCP: {ihnp4,decvax,linus}!bbncca!clements
ARPANET: clements@bbn.arpa

Everything mentioned above is probably the trademark of somebody.
The views expressed probably are different from those of my
employer, BBN, which is heavily into non-ham networks.

From -2056882132976725098
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,8e7762fba1295b33,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-12 08:33:57 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!bonnie!akgua!whuxlm!harpo!decvax!genrad!mit-eddie!

Charles_R._Carpenter.DlosLV@Xerox.ARPA
From: Charles_R._Carpenter.DlosLV@Xerox.ARPA
Newsgroups: net.ham-radio.packet
Subject: Re: Source for TNCs
Message-ID: <5298@mit-eddie.UUCP>
Date: Thu, 12-Sep-85 11:33:57 EDT
Article-I.D.: mit-eddi.5298
Posted: Thu Sep 12 11:33:57 1985
Date-Received: Sat, 14-Sep-85 06:15:05 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 11

From: CRC.DlosLV@Xerox.ARPA

Rick,

I am going to get the Kantronics unit which is selling at Texas Towers for 199 bucks. It is built and ready to go when you hook it up. Those in the area here who are using them, like them. They are available now. Looks like the best choice for the casual to moderate user.

Chuck...
W5USJ

From 4225657633927109755
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,79a694571d3a9274
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-15 12:40:46 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!houxm!vax135!ariel!mtunh!ky2d-2!ka2ugq
From: ka2ugq@ky2d-2.UUCP (Tom)
Newsgroups: net.ham-radio.packet
Subject: Re: NE-MAP.018
Message-ID: <76@ky2d-2.UUCP>
Date: Sun, 15-Dec-85 15:40:46 EST
Article-I.D.: ky2d-2.76
Posted: Sun Dec 15 15:40:46 1985
Date-Received: Tue, 17-Dec-85 04:26:19 EST
References: <719@mit-eddie.UUCP>
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 133

> From: bcn (Clifford Neuman)
> Does anyone out there have an online copy of NE-MAP.019 that they
> can send me. Thanks,
>
> ~ Cliff

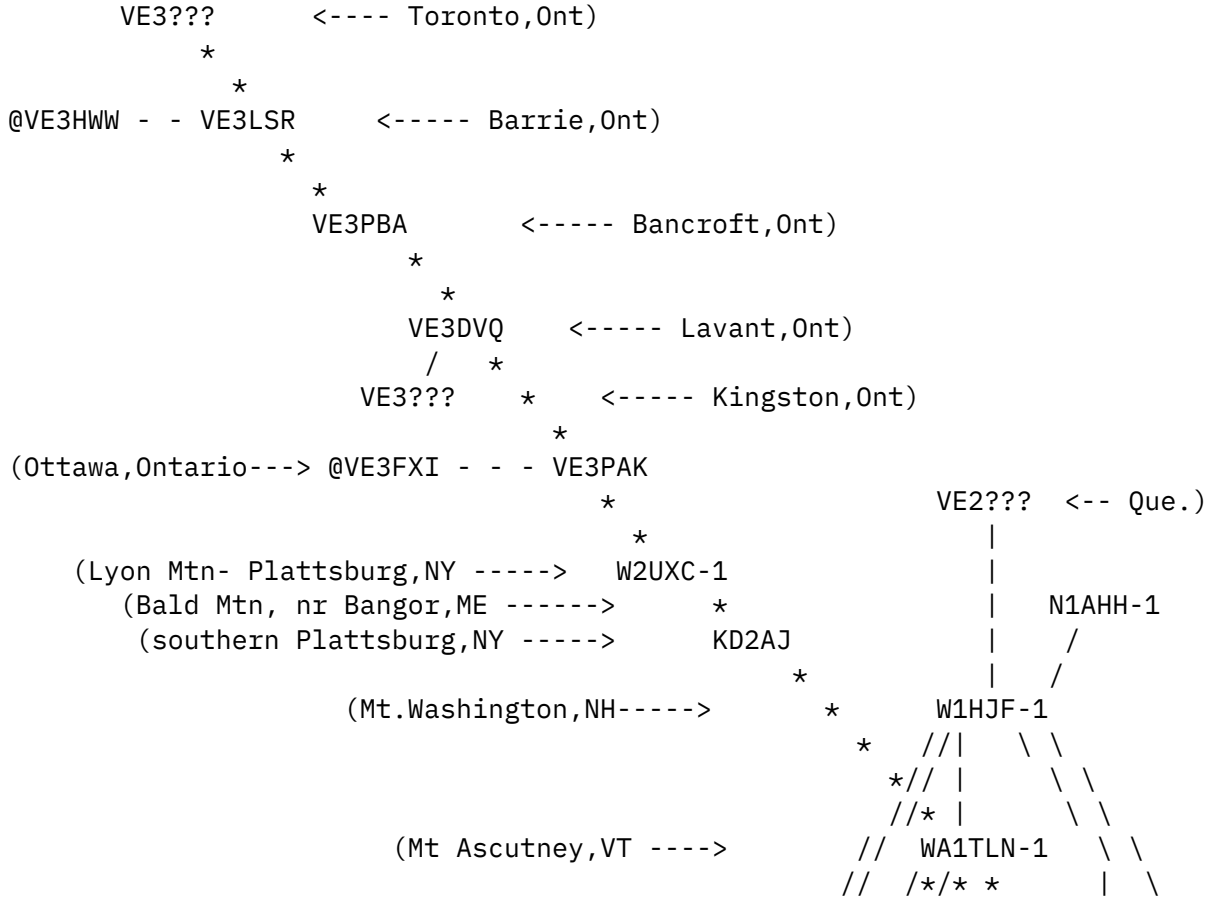
Here is NE-MAP.18D. I also have MAPR-MAP.18C which is the

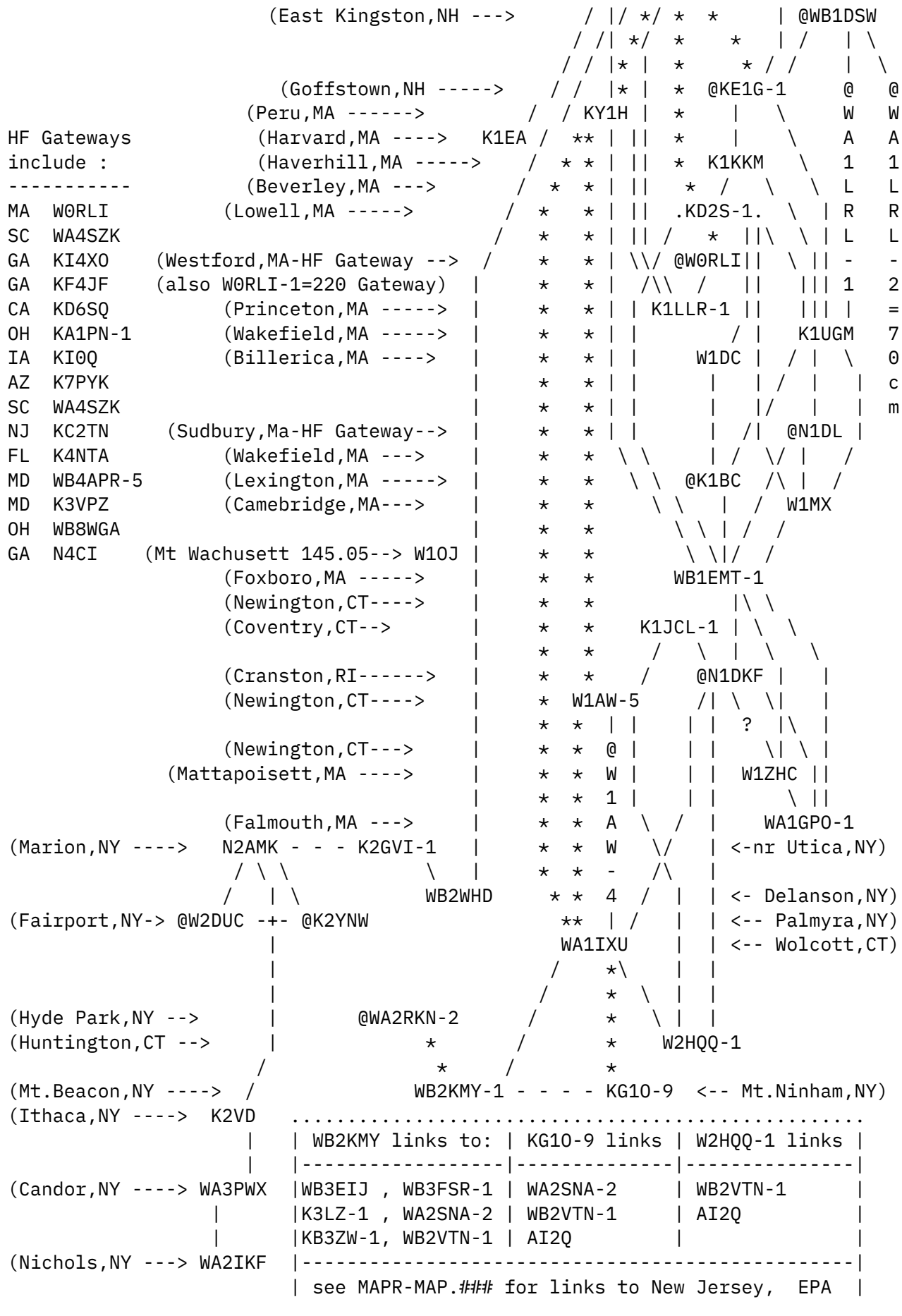
"bottom" half of it.

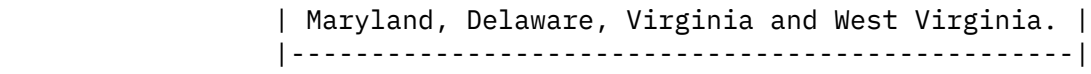
NE-MAP.18D
October 15, 1985
by K1HTV

The following is a graphic representation of Packet Radio links which are believed to exist on 145.010 MHz in the northeastern U.S. and Canada. The area covers eastern Canada, eastern New York and New England. Included in these maps are digipeaters, Packet Bulletin Board Stations (PBBS), and home stations usually left on for digipeating. Stations running W0RLI compatible software for PBBSs, Mailboxes and/or gateways are indicated by the use of the "@" character preceeding the call sign. The primary routes used for mail forwarding in EASTNET are marked with asterisks (****) while other links are shown by either a | \ or / as a connecting character. Unless indicated otherwise, all links operate on a frequency of 145.010 MHz.

Those links which are marked with a question mark (?) indicate a link of unknown reliability. If you have any information concerning known reliability, unreliablity or non-existence of any links shown on this map please drop me a note. Send the info to me, K1HTV @ W3IWI, via one of the many auto-forwarding PBBSs or via the U.S. mail.
==========




(East Kingston,NH --->
(Goffstown,NH ----->
(Peru,MA ------>
(Harvard,MA ---->
(Haverhill,MA ----->
(Beverley,MA --->
(Lowell,MA ----->
(Westford,MA-HF Gateway -->
(also W0RLI-1=220 Gateway)
(Princeton,MA ----->
(Wakefield,MA ----->
(Billerica,MA ---->
(Sudbury,Ma-HF Gateway-->
(Wakefield,MA --->
(Lexington,MA ----->
(Camebridge,MA--->
(Mt Wachusett 145.05--> W1OJ
(Foxboro,MA ----->
(Newington,CT---->
(Coventry,CT-->
(Cranston,RI------>
(Newington,CT---->
(Newington,CT--->
(Mattapoisett,MA ---->
(Falmouth,MA --->
(Marion,NY ----> N2AMK - - - K2GVI-1
(Fairport,NY-> @W2DUC -+- @K2YNW
(Hyde Park,NY -->
(Huntington,CT -->
(Mt.Beacon,NY ----> /
(Ithaca,NY ----> K2VD
(Candor,NY ----> WA3PWX
(Nichols,NY ---> WA2IKF
HF Gateways include :
MA W0RLI
SC WA4SZK
GA KI4XO
GA KF4JF
CA KD6SQ
OH KA1PN-1
IA KI0Q
AZ K7PYK
SC WA4SZK
NJ KC2TN
FL K4NTA
MD WB4APR-5
MD K3VPZ
OH WB8WGA
GA N4CI
@WB1DSW
@KE1G-1
K1EA
KY1H
@W0RLI
K1LLR-1
K1UGM
W1DC
@N1DL
@K1BC
W1MX
WB1EMT-1
K1JCL-1
@N1DKF
W1AW-5
W1ZHC
WA1GPO-1
<-nr Utica,NY)
WB2WHD
<- Delanson,NY)
<-- Palmyra,NY)
WA1IXU
<-- Wolcott,CT)
@WA2RKN-2
W2HQQ-1
WB2KMY-1 - - - - KG1O-9 <-- Mt.Ninham,NY)
WB2KMY links to: | KG1O-9 links | W2HQQ-1 links |
WB3EIJ , WB3FSR-1 | WA2SNA-2 | WB2VTN-1
K3LZ-1 , WA2SNA-2 | WB2VTN-1 | AI2Q
KB3ZW-1, WB2VTN-1 | AI2Q
see MAPR-MAP.### for links to New Jersey, EPA



Please send any corrections or additions to the above linking map to me, K1HTV @ W3IWI via one of the EASTNET Packet Radio Bulletin Board systems, the U.S. mail, or give me a phone call. Thanks.

73,
Rich Zwirko - K1HTV
12509 Ransom Drive
Glenn Dale, MD 20769
phone (301)464-2133 (5:00-10:00 PM)

Via KA2UGQ - Tom Brown

uucp: ..!ihnp4!bellcore!ka9q!tom
uucp: ..!ihnp4!mtunh!ky2d-2!ka2ugq

From 4527264227074309888
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,aaa5c90504c3b233,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-15 12:45:54 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!houxm!vax135!ariel!mtunh!ky2d-2!ka2ugq
From: ka2ugq@ky2d-2.UUCP (Tom)
Newsgroups: net.ham-radio.packet
Subject: MAPR-MAP.18C
Message-ID: <77@ky2d-2.UUCP>
Date: Sun, 15-Dec-85 15:45:54 EST
Article-I.D.: ky2d-2.77
Posted: Sun Dec 15 15:45:54 1985
Date-Received: Tue, 17-Dec-85 04:26:39 EST
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 125

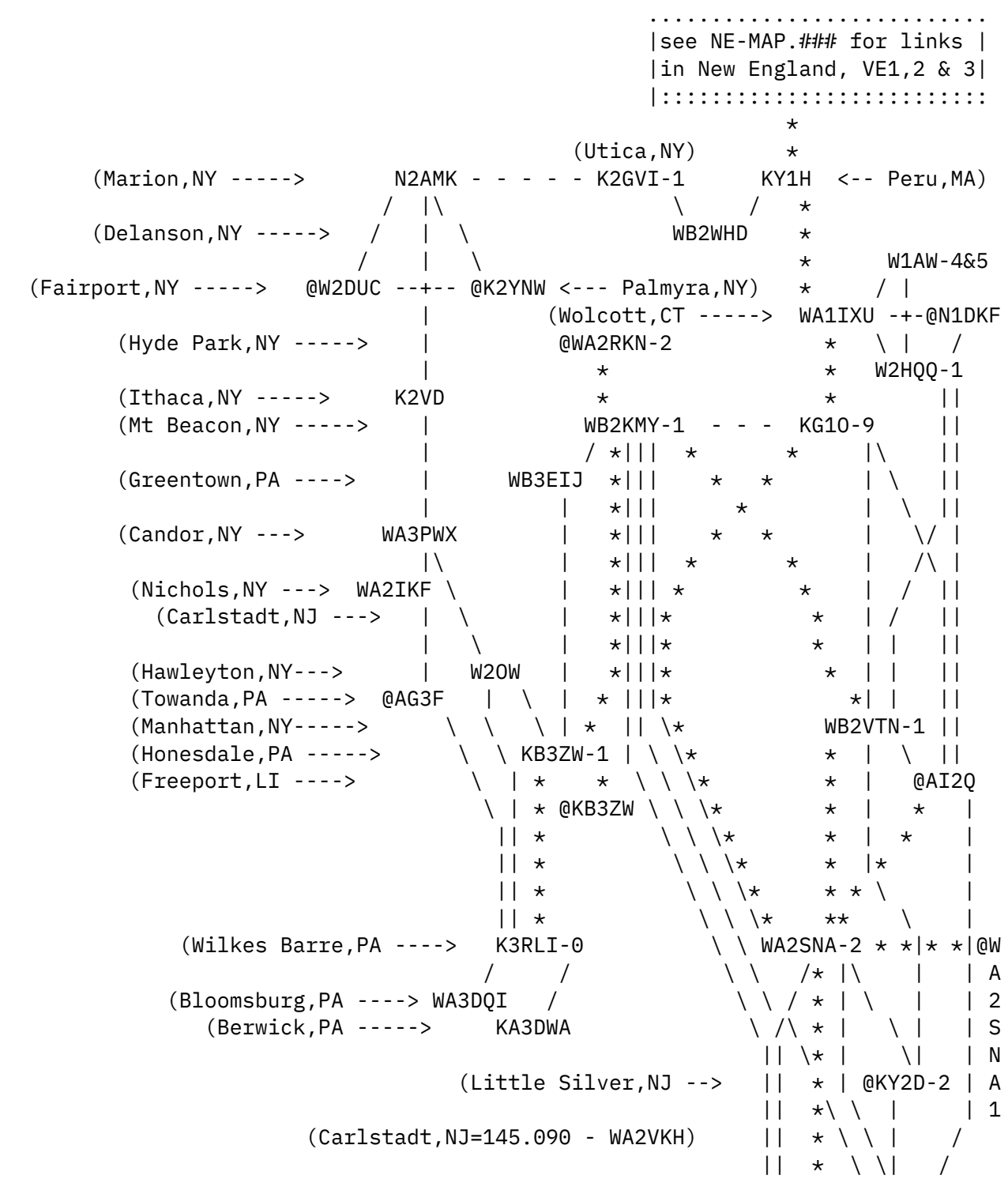
MAPR-MAP.18C
October 15, 1985
by K1HTV

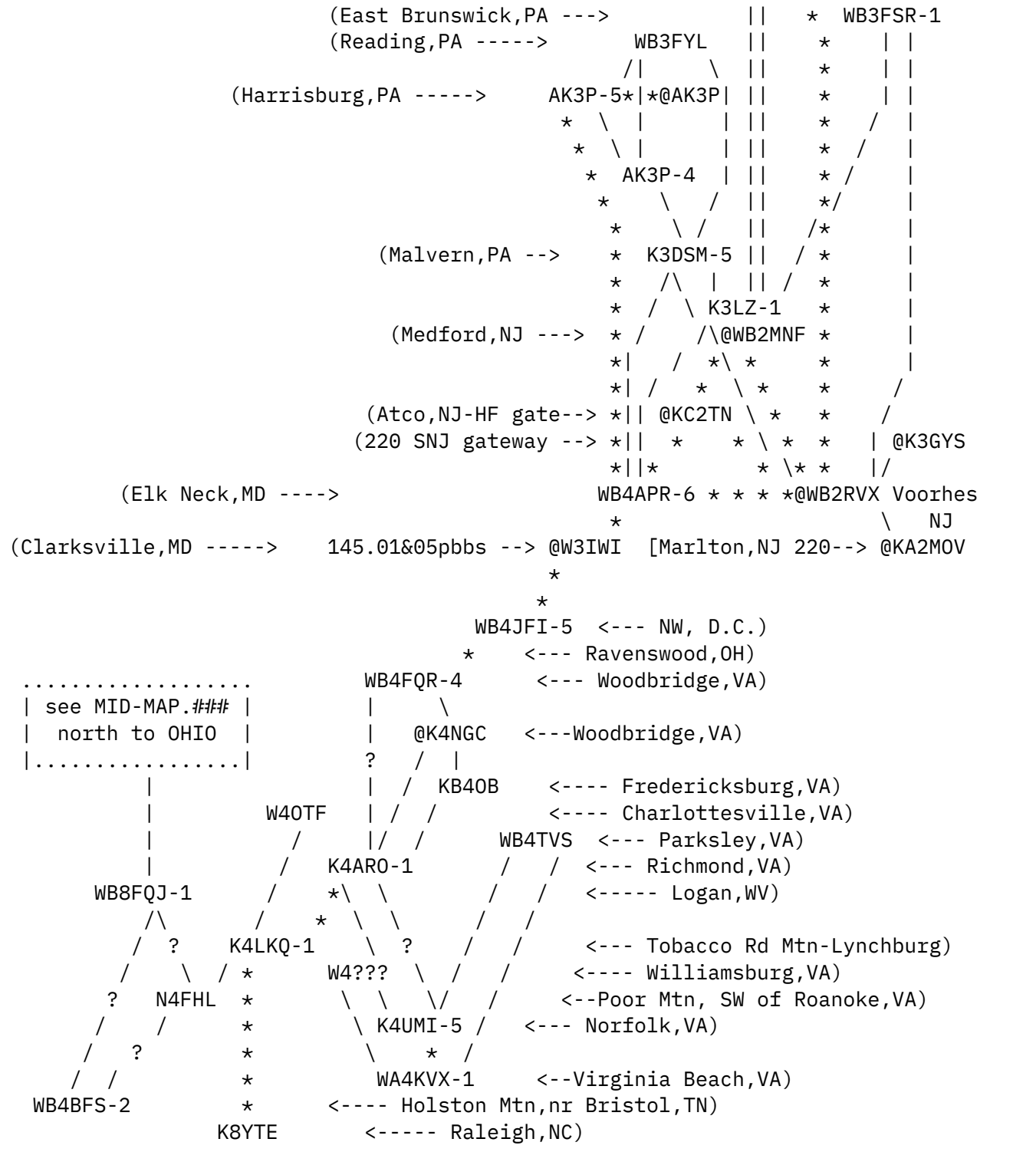
The following is a graphic representation of Packet Radio links which are believed to exist on 145.010 MHz in the eastern part of North America. The area covers from Virginia northward to MD, WV, DEL, EPA and NJ .Included in these maps are digipeaters, Packet Bulletin Board Stations (PBBS), and home stations usually left on for digipeating. Stations running W0RLI compatible software for PBBSs, Mailboxes and/or gateways are indicated by the use of the "@"

character preceeding the call sign. Paths are shown by either the | \ or the / as connecting characters. Unless noted, all VHF routes shown are presently on 145.010 MHz.

Those links which are marked with a question mark (?) indicate a link of unknown reliability. If you have any information concerning known reliability, unreliablity or non-existence of any links shown on this map please drop me a note. Send the info to me, K1HTV @ W3IWI, via one of the many auto-forwarding PBBSs or via the U.S. mail.

==========




(East Brunswick,PA ---> || * WB3FSR-1
(Reading,PA -----> WB3FYL || * | |
|/ \ || * | |
(Harrisburg,PA -----> AK3P-5*|*@AK3P| || * | |
* \ | | || * / |
* \ | | || * / |
* AK3P-4 | || * / |
* \ / || */ |
* \ / || /* |
(Malvern,PA --> * K3DSM-5 || / * |
* /\ | || / * |
* / \ K3LZ-1 * |
(Medford,NJ ---> * / /\@WB2MNF * |
*| / *\ * * |
*| / * \ * * /
(Atco,NJ-HF gate--> *|| @KC2TN \ * * /
(220 SNJ gateway --> *|| * * \ * * | @K3GYS
|| * * * |/
(Elk Neck,MD ----> WB4APR-6 * * * *@WB2RVX Voorhes
* \ NJ
(Clarksville,MD -----> 145.01&05pbbs --> @W3IWI [Marlton,NJ 220--> @KA2MOV
*
*
WB4JFI-5 <--- NW, D.C.)
* <--- Ravenswood,OH)
WB4FQR-4 <--- Woodbridge,VA)
see MID-MAP.### | | \
north to OHIO | | @K4NGC <---Woodbridge,VA)
? / |
| / KB4OB <---- Fredericksburg,VA)
W4OTF | / / <---- Charlottesville,VA)
/ |/ / WB4TVS <--- Parksley,VA)
/ K4ARO-1 / / <--- Richmond,VA)
WB8FQJ-1 / *\ \ / / <----- Logan,WV)
/\ / * \ \ / /
/ ? K4LKQ-1 \ ? / / <--- Tobacco Rd Mtn-Lynchburg)
/ \ / * W4??? \ / / <---- Williamsburg,VA)
? N4FHL * \ \ \/ / <--Poor Mtn, SW of Roanoke,VA)
/ / * \ K4UMI-5 / <--- Norfolk,VA)
/ ? * \ * /
/ / * WA4KVX-1 <--Virginia Beach,VA)
WB4BFS-2 * <---- Holston Mtn,nr Bristol,TN)
K8YTE <----- Raleigh,NC)
see SOUTHMAP.### for
links to the south

Thanks to : W4WWQ for VA-MAP.001 (NC & WVA info)

73, de K1HTV @ W3IWI
12509 Ransom Drive
Glenn Dale, MD 20769

telephone (301)464-2133   5:00P-10:00P

_____
Via KA2UGQ - Tom Brown

uucp: ..!ihnp4!bellcore!ka9q!tom
uucp: ..!ihnp4!mtunh!ky2d-2!ka2ugq

From -6129632073302331518
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e15bee6d04c7a425
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-15 13:45:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version nyu B notes v1.5 12/10/84; site rocksvax.FUN
Path: utzoo!watmath!clyde!burl!ulysses!allegra!princeton!rocksvax!dave
From: dave@rocksvax.FUN (Dave Sewhuk)
Newsgroups: net.ham-radio.packet
Subject: Re: Non-callsigns as addresses
Message-ID: <1130002@rocksvax.FUN>
Date: Sun, 15-Dec-85 16:45:00 EST
Article-I.D.: rocksvax.1130002
Posted: Sun Dec 15 16:45:00 1985
Date-Received: Tue, 17-Dec-85 04:53:57 EST
References: <727@mit-eddie.UUCP>
Organization: Xerox, Henrietta
Lines: 31

/* rocksvax:net.ham-radio.packet / clements@bbnccq / 10:47 pm Dec 12, 1985 */
As the trustee of the ATTICA-0 repeater I want to comment on what was
decided by the western New York and Southern Ontario packeteers.

The FCC/DOC call of the digipeater will be included in a beacon message that
is of general nature. ATTICA says: "BARRA digipeater N2GH-1, use ATTICA-0 to
access". The rule we are using around here is to use the first 6 letters of
the location of the digipeater. The local repeaters around here are:

```
    NIAGAR        Niagara Falls, NY  W2EUP-1
    ATTICA        Attica, NY       N2GH-1
    HALTON        Halton, Ont   (I forget who's call that is)
    OSHAWA        Oshawa, Ont   ( "" )
```

We feel this is a more mnemonic system that conveys the location of the
repeater to the user. Call signs may be nice but who knows if the
W1ABC is a repeater between Syracuse and Buffalo, it would be easier
to try ROCHES to see if there is a digipeater in Rochester to bridge the
gap.

It is true that the FCC has been very understanding by 'not looking' but
I feel that the system we are adopting is not an abuse of the intent of
the rules. Until we get a better routing system developed to make these

long hauls, we should make it as easy as we can on ourselves.

Dave - N2GH

arpa: Sewhuk.HENR@Xerox.ARPA
uucp: {ihnp4,rochester,amd,sunybcs}!rocksvax!dave
ns: "Sewhuk:HENR801C:Xerox".ns@Xerox.ARPA
ham: ATTICA>N2GH

From -6208806850574564450
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,bd427bd5337f4b09,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-15 13:46:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version nyu B notes v1.5 12/10/84; site rocksvax.FUN
Path: utzoo!watmath!clyde!burl!ulysses!allegra!princeton!rocksvax!dave
From: dave@rocksvax.FUN (Dave Sewhuk)
Newsgroups: net.ham-radio.packet
Subject: Re: ID?
Message-ID: <1130003@rocksvax.FUN>
Date: Sun, 15-Dec-85 16:46:00 EST
Article-I.D.: rocksvax.1130003
Posted: Sun Dec 15 16:46:00 1985
Date-Received: Tue, 17-Dec-85 04:54:32 EST
References: <720@mit-eddie.UUCP>
Organization: Xerox, Henrietta
Lines: 9

/* rocksvax:net.ham-radio.packet / HOFFMANN@MIT-MARIE / 1:44 pm Dec 12, 1985 */
Nope, the ID in packet with a beacon message in ASCII

Dave - N2GH

arpa: Sewhuk.HENR@Xerox.ARPA
uucp: {ihnp4,rochester,amd,sunybcs}!rocksvax!dave
ns: "Sewhuk:HENR801C:Xerox".ns@Xerox.ARPA
ham: ATTICA>N2GH

From 5382678720634702930
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,24d7fa462118b65d,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 13ba0e,24d7fa462118b65d,start
X-Google-Attributes: gid13ba0e,public
X-Google-Thread: 15f443,24d7fa462118b65d,start
X-Google-Attributes: gid15f443,public
X-Google-ArrivalTime: 1985-12-15 13:58:42 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.3 beta 11/15/85; site seismo.CSS.GOV
Path: utzoo!watmath!clyde!burl!ulysses!allegra!mit-eddie!think!harvard!caip!

seismo!mo
From: mo@seismo.CSS.GOV (Mike O'Dell)
Newsgroups: net.wanted,net.periphs,net.ham-radio.packet
Subject: Quip 1200 tech manuals sought
Message-ID: <1043@seismo.CSS.GOV>
Date: Sun, 15-Dec-85 16:58:42 EST
Article-I.D.: seismo.1043
Posted: Sun Dec 15 16:58:42 1985
Date-Received: Tue, 17-Dec-85 05:02:32 EST
Organization: Center for Seismic Studies, Arlington, VA
Lines: 9
Keywords: Quip 1200 tech manuals wanted
Xref: watmath net.wanted:7774 net.periphs:946 net.ham-radio.packet:180

I am looking for a technical/service manual for a Quip 1200 fax machine.
User documentation would also be helpful (what kind of paper, where to
get it, etc.), but I am interested in speed converting it for amateur
and SWL fax transcription. A conversion article for the Quip 1000
has appeared, but the 1200 is noticably different inside, using a servo
to do the speed control instead of a synchronous motor. So, I am in
search of said documentation.
     Thanks,
     -Mike O'Dell

From 4851900313088189496
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,a2c9a6a117be461b,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-15 16:38:26 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!houxm!vax135!ariel!mtunh!ky2d-2!kc2zv
From: kc2zv@ky2d-2.UUCP (Bill)
Newsgroups: net.ham-radio.packet
Subject: HP150 on packet?
Message-ID: <79@ky2d-2.UUCP>
Date: Sun, 15-Dec-85 19:38:26 EST
Article-I.D.: ky2d-2.79
Posted: Sun Dec 15 19:38:26 1985
Date-Received: Tue, 17-Dec-85 04:26:56 EST
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 6

*** REPLACE THIS LINE WITH YOUR MESSAGE ***
Is anyone besides me using an HP 150 personal computer on
packet radio? I'd like to exchange mail with other users of the 150.
THanks in advance.

73, Bill kc2zv

From -3522294421210562946
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,c1b01c39c048557b,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-16 05:19:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version nyu B notes v1.5 12/10/84; site rocksvax.FUN
Path: utzoo!watmath!clyde!burl!ulysses!allegra!princeton!rocksvax!drdave
From: drdave@rocksvax.FUN (Dave Birnbaum)
Newsgroups: net.ham-radio.packet
Subject: DED PROM problem solved!
Message-ID: <1130004@rocksvax.FUN>
Date: Mon, 16-Dec-85 08:19:00 EST
Article-I.D.: rocksvax.1130004
Posted: Mon Dec 16 08:19:00 1985
Date-Received: Tue, 17-Dec-85 07:28:59 EST
Organization: Xerox, Henrietta
Lines: 10

If location c0025 is changed from 01 to 00 then the WA8DED
software doesn't check for "legal" callsigns. There is
only a cryptic reference to this "feature" in the documentation,
and I see no way to do it other than re-programming the PROMs.

Thanks for the replies

Dave, K2LYV

From 7955658938228425859
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,611fc57a4e62eb6e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-16 19:54:54 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site inuxi.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!inuxc!inuxi!wheatley
From: wheatley@inuxi.UUCP (Steven Wheatley)
Newsgroups: net.ham-radio.packet
Subject: GATEWAY Vol 2, #8
Message-ID: <269@inuxi.UUCP>
Date: Mon, 16-Dec-85 22:54:54 EST
Article-I.D.: inuxi.269
Posted: Mon Dec 16 22:54:54 1985
Date-Received: Wed, 18-Dec-85 02:28:52 EST
Distribution: net
Organization: AT&T Consumer Products, Indianapolis
Lines: 391

Gateway: The ARRL Packet-Radio Newsletter
Volume 2, Issue 8

December 06, 1985

Published by:
ARRL
225 Main Street
Newington, CT 06111

Editor:
Ed Raso, WA2FTC

ATLANTA HOSTS SOUTHNET II

"On November 23-24, the Southnet II conference took place on the campus of Georgia Technical Institute in Atlanta, Georgia. Approximately 150 people attended the two-day packet-radio meeting, some from as far north as Wisconsin. The meeting was broken-down into three sections: 1) Users; 2) Advanced Packet Techniques; and 3) State Organizations.

USER SESSIONS

"The user section was directed toward beginners. Pete Eaton, WB9FLW, presented the now-famous Pete's Packet Primer. The primer was followed with a demonstration of Hi-Res picture transfer by Buck Rogers, K4ABT, and Glynn Rogers, WB4RHO. Buck has been transferring digital images for the past six months using Radio Shack Color Computers. During one recent hurricane in Florida, Buck downloaded weather satellite pictures and relayed them on 145.01 MHz via packet radio. Doug Drye, KD4NC, presented a primer on basic networking and current alternatives. John Smith, KI4XO, presented a program on the popular W0RLI Mailbox/Gateway system, followed by a discussion on using the system on HF and VHF. John has worked with Hank Oredson, W0RLI, on the mailbox software over the past several months. This was a particularly important discussion, since Georgia will be using the W0RLI Mailbox/Gateway system to provide an interim network in the state as of January 1, 1986. John, and Doug Drye, KD4NC, are working on a version of the mailbox to be used in the Georgia network.

"TNC user demos were provided by Pete Eaton, WB9FLW, on the TAPR TNC 2, Tag Spivey, N4EMM, on the Kantronics Packet Communicator, and Jim Griffith, WB5RAX, on the AEA PK-64. Chet Lambert, W4WDR, Publisher of Computer Trader Magazine (CTM) gave an update on the magazine's packet-radio contest. Chet explained that plaques would be offered instead of the prizes originally planned.

"Attendance at these sessions demonstrates that packet radio is entering the user phase of development, with greater need for information and coordination. This need must be addressed immediately if packet radio is to continue a smooth growth.

ADVANCED SESSIONS

"Jack Brindle, WA4FIB, presented "Session Layer Protocol" based on a great deal of work with Mac Packet Term, his software interface for the Macintosh computer to several TNC's. Gwyn Reedy, W1BEL, presented Tom Kneisel's paper dealing with the relatively unsuccessful efforts to use the K9NG modem with Spectrum Communications 220 MHz radio. Gwyn laid out FADCA's plan to use the 220 MHz wideband allocation with 220 MHz radios at 1200 bit/s until a "good high-speed modem is developed."

"Lyle Johnson, WA7GXD, unveiled the modem and disk controller boards for the TAPR Network Node Controller (NNC), and presented the design philosophy behind the NNC and related components. Details were given on each board, along with parts specifications and tentative pricing. Lyle's presentation was video taped, and is available for $15.00 from:

GRAPES
P.O. Box 1354
Conyers, GA 30208

"Bryon Lindasy, W4BIW, presented the latest update on Pacsat scheduled to be launched in 1987. PACSAT will have a low earth orbit of about 500 miles, an orbital period of 90 minutes and an access window of 10 minutes. The uplink will be on 420 MHz and downlink on 2 meters. PACSAT will carry four megabytes of memory, and plans are in the works to provide a gateway to the satellite from the Atlanta area.

"Bob Mc Gwier, N4HY, discussed the SAREX II packet-radio shuttle experiment. The shuttle will carry a specially outfitted TRS-80 model 100 and TNC 2. Users on the ground will connect to the station, be given a QSO number and then automatically disconnected. The QSO will be logged, and a QSL will be sent upon request. Bob has been checking the software at his home in Auburn, Alabama.

"Jim Worsham, WA4KXY, gave a tutorial on modulation techniques, and made some suggestions for hardware which will support high-speed communications. Ed Jackson of GLB reported on GLB's design philosophy, and a number of ongoing packet-radio-related projects.

STATE SESSIONS

"More than 50 digipeater and W0RLI BBS providers attended the state sessions. Current frequency plans and locations of 145.01 MHz digipeaters were among the topics discussed. A proposal for a Georgia state networking conference was accepted and ratified by by GRAPES and accepted in principle by adjoining Southnet states.

"At the Saturday evening dinner, Gwyn Reedy, W1BEL, was presented with a plaque for his outstanding contributions to packet radio in the region. Southnet Certificates of Appreciation were awarded to Howard Goldstein, N2WX, for his continued dedication to networking, and to Tom Kneisel, K4GFG, for his work on the high-speed modem project. Certificates of Appreciation were also awarded for contributions to packet radio in the state of Georgia. Recipients were: KD4NC, KF4JF, WB4GQX, N4CI, WD4LYV, WB2CPV and K4ABT.

"Southnet was a success by any standard, and the attendance was very gratifying. It is obvious, however, that more of these regional meetings are needed as packet radio continues to grow."

From N4CI

W0RLI BBS CLONE

Jeff Jacobsen, WA7MBL, reports that he has almost completed a translation of the popular W0RLI BBS software into Turbo Pascal for use on the IBM PC/XT/AT. The mail function, including forwarding and the gateway are working. Several local commands still need to be implemented. Since Jeff has never "seen a real W0RLI BBS in operation " he has no way of knowing if it will look exactly correct. If you are interested in testing it "as is" contact :

Jeff Jacobsen, WA7MBL
1400 E 900 N
Logan, UT 84321

Via DRNET

CALL FOR PSR ARTICLES

The deadline for the January issue of the PSR Quarterly is December 20, 1985. This is a "no-slip" date because PSR must be finalized and sent to TAPR by December 30, 1985. All previous and potential writers are encouraged to contribute. Articles dealing with construction, modification, or understanding of hardware and software are especially useful. As always, information on networking is desired.

Articles may be submitted via CompuServe to 76576,2003. You may also mail a diskette, (eight-inch SSSD or five-inch Kaypro 4, or 360 kbyte PC format) to:

PSR Editor
812 Childers Loop
Brandon, FL 33511

Via DRNET

TAPR CEASES TNC2 PRODUCTION

Tucson Amateur Packet Radio is pleased to announce the cessation of its production of the popular TNC 2 kit!

Yes, pleased. An all volunteer R&D, manufacturing, marketing, and support organization is fun for awhile, but it soon takes a great toll on all involved.

TAPR began life in 1981 with a simple goal: to experiment with packet radio and packet-radio networks. At that time there was little in the way of easily acquired packet equipment. TAPR took a short side trip into the manufacturing world - to permit widespread experimentation with packet radio by making high quality software and hardware building blocks available on a large scale at low cost.

That job is now complete. The TNC 2 design is stable, and presents a good balance between small size, low power, and ease of manufacture, while still allowing for high-speed, full-duplex operation, adaptability to future requirements such as split-baud-rate operation, and easy interface to future modem designs.

It is now time to turn the manufacturing and marketing tasks over to industry, and to continue with research and development in new areas of packet radio. We have made our TNC 2 design available to others through an OEM agreement. These alternate sources are listed below:

Advanced Electronic Applications, Inc.
PO Box C-2160
Lynnwood, WA 98036
(206) 775-7373

Model PK-80. Assembled and tested only. Available from dealers. (AEA also produces the PKT-1 -- a TAPR TNC 1 clone -- and the PK-64 designed especially for the Commodore 64 computer.)

GLB Electronics, Inc.
151 Commerce Parkway
Buffalo NY, 14224
(716) 675-6740

Model TNC-2A. Kit form only. Factory direct. (GLB also produces the PK-1 and PK-1L "software approach" assembled and tested TNCs.)

MFJ Enterprises, Inc.
PO Box 494
Mississippi State, MS 39762
(601) 323-5869

Model MFJ-1270. Assembled and tested only. Available from dealers.

PacComm Packet Radio Systems, Inc.
4040 Kennedy Blvd., Suite 620
Tampa, FL 33609
(800) 835-2246 Ext. 115 (orders only)
(813) 689-3523 (technical/service info)

Model TNC-200. Assembled and tested/Complete kits/Partial kits. Factory direct.

Therefore, assured of the continued availability of high quality TNCs at reasonable prices, TAPR has ceased production with TNC2 order #1200 (s/n 3721).

TAPR will continue to support software development for the TNC 2 as well as the earlier TNC 1. Other ongoing projects include the TAPR NNC (a network node controller), higher-speed modems, packet satellite support, and other areas of packet development. If enough demand exists, TAPR may make bare boards (no parts) available to experimenters. TAPR has no new TNC hardware products in development at this time.

We invite you to become a member of TAPR, and to attend the next annual membership meeting in Tucson on February 8th, 1986.

TAPR wishes to extend its heartfelt thanks to you, the Amateur community, for your strong and continuing support.

From WA7GXD

WANTED: VOLUNTEER SOFTWARE DEVELOPERS

"As many of you are already aware, the new TAPR Networking Node Controller (NNC) is nearing completion of prototype hardware debugging. The NNC is a four-port packet controller with a large memory area, direct-memory access (DMA) capability for I/O -- and Z80 software compatibility.

"We are looking for volunteers to assist in developing software for the following: low-level, highly efficient drivers for the I/O; AX.25 Level Two handler that can handle multiple logical and physical channels; Level Three and Level Four; and loaders for uploading software updates to a remotely sited NNC. We are hoping that there will be early porting of multiport digipeater

code to this unit as well as a W0RLI PBBS. The hardware should be verified during December. If all goes well, we will want to put Alpha units in the hands of developers in late January or early February. Assuming a couple of months to get enough software together to make Beta testing meaningful, we will be looking for Beta testers in the March-April time-frame. Once testing has advanced to the point of reasonable confidence, we will make the units generally available (summer of 1986?).

"We are not looking for folks who want to be the first kid on the block with a new toy. We need people who are committed to amateur packet radio and want to help make a meaningful contribution to a very large and difficult task.

"Coordination is going to be a tough assignment. Without proper coordination, a lot of wheels will spin, and a lot of energy wasted in duplication of efforts. A BBS to swap code modules will be needed. All code will need to be carefully, accurately and exhaustively documented -- by the author!

"Developers will need to procure the following:

1) One NNC digital unit - projected cost is $175. This is an NNC with HD64180 uP, 64 kbytes of bbRAM, 32 kbytes of EPROM, four HDLC ports, two parallel (Centronics-compatible) ports, two async ports and one SCSI interface. The SCSI chip may not be included at this price, we are not sure yet, but for the Alpha testers/developers it will be. This unit will be fully assembled and "tested."

2) One NNC Floppy Adapter - projected cost $125. This includes a DMA'ed Floppy Controller that can handle 4 diskette drives. This unit will not support 8-inch drives (lack of 8-inch support is intentional). The price includes a licensed copy of Z-DOS, a CP/M 2.2 compatible operating system. It will be on 5.25-inch double-sided 48tpi diskette format capable of 368 kbytes (formatted). If the decision is made up front to use 96tpi drives, TAPR will copy the licensed diskette to the denser format and supply the original as well as the high-density copy to the purchaser.

3) A pair of 5.25-inch floppy drives. Maybe we can do a group purchase of TEAC 55Bs. Figure $150 for this expense. 48tpi or 96tpi are about the same price. 48tpi yields about 400 kbytes formatted. 96tpi about 800 kbytes formatted.

4) A power supply. $50 from surplus?

5) One NNC Modem board - projected cost is $150. This is a wired and tested board which includes one 300-baud 2206/2211 modem with tuning indicator and three 1200-baud 2206/2211 modems. We might get this cost down to $125.

"Thus, there is a cost of participation that will be a minimum of $450 and may be $650. Add to this the cost of an assembler or compiler. The assembler that seems to make the most sense is ZAS, from Echelon systems. Again, we can probably do a group purchase or multiple-site license for this project. This assembler supports the extended instruction set of the HD64180 cpu. There is no reason to limit ourselves to the Z80 instruction set or the 8080 subset for this project. And ZAS is fairly cheap - about $50, I think.

"I don't know which C or Pascal compiler will be chosen. I assume that one will be chosen, so the high-level code can be written in a transportable high-level language (makes for easier testing?) while the interfaces to the hardware can be done in assembly language. Preferably, the compiler will generate Z80 (or 64180) source code for assembly by ZAS. This allows hand-optimization of the compiler output.

"By standardizing on the development environment (NNC w/5.25-inch floppies) and the tools (assembler, compiler(s)), we hope to make it easier for all participants to share their work amongst the group.

"It is expected that all code (including source code) developed for this project will be placed in the public domain for noncommercial use. And that TAPR will be given explicit (not exclusive) right to distribute it.

"If you have the time and ability and want the chance to make a real contribution to Amateur packet radio networking development, please write the TAPR office. We will put you on file and notify you when we are ready to get started with Alpha test or Beta test (as you indicate to us).

"For Alpha test, we need developers. Committed developers. People who really understand software design, hardware/software interaction, protocol implementation, code size/speed trade-offs, data structures and myriad other facets of software design. And of course, understand networking...

"For Beta test we need testers. People who are in a real packet environment, who have a good site that will get plenty of exercise on the air, who have the time and commitment to submit detailed reports of what works and what doesn't. This isn't a "be the first person on your block to own an NNC" contest; it is going to require work. "If you are a capable packeteer, committed to assist in networking development, please provide us with the following:

Full name.
Amateur Call sign.
Mailing address.

Daytime telephone number.
Evening telephone number.
Alpha or Beta test.
TAPR membership number (if applicable).
Specific areas of expertise that you wish to make available to this project (low levelinterface/high level protocol implementation documentation, testing, etc.

From TAPR

REPRODUCTION OF GATEWAY MATERIAL

Material may be exerpted from Gateway without prior permission, provided that the original contributor is credited and Gateway is identified as the source.

From 664456953882985594
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,c91dfa2ddf9c6a3e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-23 03:56:14 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Link Layer thoughts
Message-ID: <777@petrus.UUCP>
Date: Mon, 23-Dec-85 06:56:14 EST
Article-I.D.: petrus.777
Posted: Mon Dec 23 06:56:14 1985
Date-Received: Wed, 25-Dec-85 01:01:25 EST
Organization: Bell Communications Research, Inc
Lines: 160

Recently I've been thinking about ways to improve the performance of link level protocols on noisy links, and I came across a very interesting idea.

In the paper "ALOHA Packet Broadcasting - A Retrospect", by Binder, et. al., published in the 1975 (10 years ago!) National Computer Conference, are the following interesting sections:

[KA9Q Note: the "MENEHUNE was the ALOHANET's packet switch, analogous to our TNC. Its name is an obscure wordplay. The ARPANET people were calling their packet switches "IMPs" (Interface Message Processors), so the ALOHA people simply chose the Hawaiian word for "imp", as in "mischevious dwarf".]

"Error control for broadcast channel data packets (MENEHUNE to user nodes)

involves some special considerations. For efficient operation, the usual positive acknowledgment scheme in which the ACK's themselves are not acknowledged depends on a high probability of the ACK's being successfully received. However, an ACK sent from user nodes must compete with data traffic in the random access channel. At full channel loading each random access packet must be retransmitted an average of 1.7 times, which means each data packet or ACK must be sent a total of 2.7 times on the average before it is successfully received. But in order to force retransmission of the ACK's, the data packet being acknowledged must also be sent an average of 2.7 times by the MENEHUNE - even though it was received correctly the first time!....

[ka9q note: these numbers come from the fact that running a pure ALOHA channel at the optimum throughput level of 1/2e or 18.4% requires an "offered load" of 1/2 or 50%. I.e., the channel will have at LEAST one carrier on it 50% of the time, but only 18% of the time will there be ONLY one carrier. This means that each packet has a probability of (1/2e) / (1/2) = 1/e = 36.8% of making it across, and therefore packets must be sent on the average 1/(1/e) = e = 2.718 times to make it across once.]

"...to eliminate the unnecessary repetitions of data packets from the MENEHUNE, it is also necessary to acknowledge the ACK. That is, the ACK sent by a user node is timed out and retransmitted until an acknowledgement for it is received, just as for data packets. If another packet is waiting for transmission to the node at this time, its transmission with the next sequence number constitutes the ACK to the ACK; otherwise, a short ACK-ACK packet is sent by the MENEHUNE. This can be easily shown to result in significantly less total channel overhead, at the expense of more complication in the node implementation."

I was intrigued by this idea and decided to study it further. What follows is my initial analysis of the ACK-ACK protocol and how it compares to the current AX.25 protocol.

In AX.25, ACKs are not acknowledged. This means that if the probability of getting a packet across a given channel is p, then on the average, A = 1/p transmissions of the ACK by the receiver will be necessary for the sender to get one back. To elicit 1/p ACKs from the receiver, the sender has to send D = 1/p * A = 1/(p**2) data packets. For example, if p = .5 (50% probability of getting a packet across the channel), then you can expect, on the average, A = 2 transmissions of the ACK and D = 4 transmissions of the data packet before sender can go on to the next data packet. If p = .25, then A = 4 and D = 16.

Note I've assumed for sake of illustration that p is equal in both directions; in the "real world" a data packet is a bigger target than an ACK and is therefore even more likely to get clobbered.

To show the effect of ACK-ACKs, I'll define a number N, the ratio between the sender's data-retransmission timer to the receiver's ACK-retransmission timer. We assume that this number is always greater than 1. (If it wasn't, the sender would always time out and resend the data before the receiver

ever gets a chance to retransmit its ACK). N therefore represents the number of times the receiver will attempt to retransmit its ACK before the sender unnecessarily resends its data packet (which is what we'd like to avoid).

The probability P of getting an ACK through at least once in N transmission attempts when each attempt has probability p of succeeding is

```
P = 1 - (1 - p)**N
```

Make N large enough, and P approaches 1 (i.e., the ACK will almost certainly get through.) Of course there will still be plenty of data packet retransmissions, simply because (1-p) of them will never make it to the receiver in the first place. So the total expected number of data packet transmissions D changes from 1/(p**2) in the present case to (1/p) * (1/P) with ACK-ACKs. Let's plug in some numbers and see what effect this has on D, the expected number of data packet transmissions.

```
p = .5, N = 5, no ACK-ACK case:
     D = A * 1/p = 1/(p**2) = 1/(.5*2) = 4
same, with ACK-ACKs:
     P = .969
     D = (1/p) * (1/P) = 2.06, a 49% decrease

p = .25, N = 5, no ACK-ACKs:
     D = 16
same, with ACK-ACKs:
 P = .763
     D = 5.24, a 67% decrease
```

You may be asking "what about the extra overhead of the ACK-ACK"? Recall that a new data packet can serve as an ACK-ACK. So long as there is a steady stream of traffic, "standalone" ACK-ACKs are never transmitted; the next data packet provides that function. Only at the end of a traffic burst is an extra packet generated, and this seems a small price to pay to save all those unnecessary retransmissions.

So clearly we have something here. The question is how to implement it.

I am not certain that this technique can be adapted easily to LAPB, the connection-oriented upper sublayer of AX.25 Level 2. It may be possible, but it would take some work. LAPB was originally intended for highly reliable point-to-point links, and radical surgery may be necessary. In any event, LAPB is an unnecessarily complex link level protocol for a datagram network, so I already have a motivation for doing a lobotomy instead.

Fortunately, there are "hooks" in AX.25 that allow us to dispense with LAPB and implement the ACK-ACK protocol while still conforming to the AX.25 addressing format. We need three types of packets to implement the ACK-ACK protocol: a data packet, a regular ACK packet (sent in response to the data packet) and an ACK-ACK packet (sent in response to the regular acknowledgment when no additional data is available). Here's one possible assignment:

data packet - UI frame with or without Poll bit set

regular ack packet - UA, with or without Final bit set
ACK-ACK - empty UI frame with Poll bit cleared

The poll/final bits allow either or both acknowledgments to be optional. For example, stations in a datagram network operating on high quality links with very low packet loss rates might elect to operate without the overhead of link level acknowledgments; in this case, each data packet is sent in a UI frame with the poll bit cleared. Similarly, when regular acknowledgments are requested (i.e., with the poll bit set in UI data frames), the receiver uses the final bit in the UA to indicate whether an ACK-ACK is requested. Since a new data packet can be sent in place of an ACK-ACK, making both out of UI frames simplifies the receiver implementation. In each case, setting the poll/final bit means that some sort of response is expected from the other side, which also simplfies the implementation.

Notice that there are no sequence numbers, since a sliding window protocol such as LAPB is unnecessary on a half duplex channel. The protocol operates in a lock-step fashion; there is always a one-for-one relationship between a data packet and its acknowledgement, and this simplifies things enormously. Since packets cannot "cross in the mail" on a shared half-duplex channel, there is never any ambiguity as to which data packet an ACK refers to (note that this assumption is violated and the protocol breaks down in two situations: a long digipeater string where the end stations cannot hear each other directly, and on a long-delay satellite channel where the round trip delay exceeds the packet transmission time. Digipeaters we're already getting rid of, and I'll worry about high speed satellite channels when we get one.)

The only "state" required in the protocol is a buffer for the most recently sent or received packet. (The transmitter may need to resend it and the receiver needs to detect and filter out duplicates transmissions). However, once a packet has been sent and fully acknowledged, no state needs to be maintained, a MAJOR advantage when servicing a large number of mostly idle local "links" with limited memory.

Comments and suggestions on this idea are welcome.

73,

Phil Karn, KA9Q

From -215062306163366969
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d7190eb93a193c27,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-30 11:46:36 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site lanl.ARPA
Path: utzoo!linus!philabs!cmcl2!lanl!tl
From: tl@lanl.ARPA
Newsgroups: net.ham-radio.packet
Subject: packet modems

Message-ID: <35640@lanl.ARPA>
Date: Mon, 30-Dec-85 14:46:36 EST
Article-I.D.: lanl.35640
Posted: Mon Dec 30 14:46:36 1985
Date-Received: Wed, 1-Jan-86 04:11:31 EST
Distribution: net
Organization: Los Alamos National Laboratory
Lines: 9

I am new to packet radio an am looking for some information about the various packet controllers on the market. Which manufacturer (MFJ, Kantronics, Pac Comm etc.) offers a better box for the money? Who should I stay away from and where can a budding packeteer get info regarding Rules & Regs, Packet Conventions and Protocol, and sources of data & Equipment?

I appreciate any and all comments. Thanks and very 73.
Terry, WA5ZKP

From 4576183428603878378
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,eb38b305bfaf18a2,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-30 18:18:23 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site inuxi.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!inuxc!inuxi!wheatley
From: wheatley@inuxi.UUCP (Steven Wheatley)
Newsgroups: net.ham-radio.packet
Subject: GATEWAY Vol 2, #9
Message-ID: <271@inuxi.UUCP>
Date: Mon, 30-Dec-85 21:18:23 EST
Article-I.D.: inuxi.271
Posted: Mon Dec 30 21:18:23 1985
Date-Received: Tue, 31-Dec-85 06:24:36 EST
Distribution: net
Organization: AT&T Consumer Products, Indianapolis
Lines: 394

Gateway: The ARRL Packet-Radio Newsletter
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Newington, CT 06111

Editor:
Ed Raso, WA2FTC

Beginners' Packet Net

"A beginners' packet net has been started in the Lowell/Lawrence Massachusetts area. The net meets Friday evenings at 8:00 PM alternately on the Lowell repeater (145.490 MHz), and the Haverhill repeater (146.625 MHz). Conductor of the net is Joe Demers, WA1WLV. Topics of discussion in recent weeks have been: PBBS operation, Terminal programs for computers and TNC operation. The purpose of the net is to help the packet-radio neophyte."

From NEPRA PacketEar

Upper East Tennessee Packet

Late this year, packet radio arrived in Upper East Tennessee with the installation of the WB4BFS-2 digipeater. Located on top of Holston Mountain, the digipeater boasts an impressive height of 4300 feet above sea level. Links are now common to West Virginia via WB8FQJ-1 and into South Carolina and Georgia via W4FX-1. A local PBBS is also operational under the call sign of W4XS. Mail is being forwarded to South Carolina and Georgia. Further west, Knoxville, Tennessee packeteers are active with digipeater KB4NK-1 and packet bulletin boards K4EID and KC4OI. All VHF activity is presently on 145.01 MHz.

Via W4XS

Packet-Radio Band Plan Proposal

The following frequency plan for Michigan packet radio was adopted for further discussion by the Packet Radio In Southern Michigan (PRISM) Spectrum Planning Committee.

144.91 MHz	Experimental and QRP
144.93 MHz	Local Area Network
144.95 MHz	Local Area Network
144.97 MHz	Local Area Network
144.97 MHz	Non digipeated packet (simplex)
145.01 MHz	Inter-LAN and mail forwarding
145.03 MHz	Local Area Network
145.05 MHz	Local Area Network
145.07 MHz	Local Area Network
145.09 MHz	Experimental and QRP

"Michigan Repeater Council policy does not allow coordination of packet channels on 144-148 MHz. These are designated as simplex channels that may be used in any mode by amateurs at any given location. Activity in this area is by "gentleman's agreement" Anyone is allowed to install a digipeater or a PBBS. The type of

packet activity allowed on a particular channel is determined by the need, not by the council. The above listed frequencies are recommended as a guideline for a "gentleman's agreement" in Michigan.

Frequencies for Local Area Networks (LANs) would be activated in the following order:

1) 145.03 MHz
2) 145.05 MHz
3) 145.07 MHz
4) 144.97 MHz
5) 144.95 MHz
6) 144.93 MHz

The lowest numbered available frequency would be used, unless it poses a potential traffic conflict with the desired LAN.

The objective is to avoid conflicts with existing voice operations on the above frequencies. We feel that it is important for packet radio to expand in a contiguous group of frequencies, and not all over the 2 meter band. This will help "carve out" a segment of 2 meters that ultimately will become recognized as the "packet sub-band."

From PRISM

PACKET RADIO ON THE MOVE-- THE CLUB CONNECTION

(Fifth in a series by Steve Place, WB1EYI, Manager, ARRL Volunteer Resources Office)

Pierre Packette, ace techno-klutz and purveyor of pithy packet misconceptions, asks that we recap what we're trying to accomplish. It seems that amidst the fun and frolic of his first packet-radio club meeting he's forgotten why he's doing what he's doing.

Your local packet-radio user base is needed before packet radio's potential can be met. As most of the technical pieces are now in place and the heretofore scarce TNCs now abound, the sooner you initiate the great unwashed masses in the ways of the Packeteer, the better. A time-tested approach for accomplishing your objective -- one that gives you the "biggest bang for the buck" (that is, produces the greatest number of motivated recruits for the amount of effort you invest) -- is the well-organized campaign to form a local packet radio club.

Your primary objectives are to (1) increase the number of packet-radio users within a 50-mile radius; (2) develop the variety of packet-radio applications in your area; and (3) increase the participation of others beyond your initial core/corps of

Packeteers in developing, supporting and maintaining local packet-radio projects (applications).

The strategy? Organize your recruitment effort in advance. Only then take the first in the straightforward series of steps that will pilot you safely through the rocky shoals of your first club meeting and chart your course for the year ahead.

In recent installments we've covered inviting key Amateur Radio leaders to the first open meeting; publicizing that first meeting among hams and non-hams alike in your desired area of coverage; and kicking off the meeting with the warm welcome, the "chatty" audience assessment, and the packet radio overview-tutorial. Steps yet to be covered are the hands-on demonstration, the special-interest working groups and the post-meeting social get-together.

Baptism of Fire -- The Demonstration
or
Let Their Fingers Do the Walking

Time for the long-awaited demonstration, the key move in the packet-radio-club ploy. Your mission is to

* demystify packet-radio operation, calm your guests' techno-fears and convince each potential Packeteer that acquiring the needed gear is all that stands between him and packet-radio nirvana;

* bring your guests to a point where they understand the advantages, the potential and the fun of packet radio.

Do everything in your power to stack the deck in your favor. And by preparing thoroughly, deal Murphy a bust hand. A lot of work? Yes. But a lot of work that will have to be done only once if you do it right this time.

When you and your cohorts lay the groundwork for this, the big moment, come as close as you possibly can to achieving the ideal. Get every one of your cohorts involved -- a successful show is not a one-man show. PREPARE!

Equipment

* If at all possible set up at least three VHF packet stations in the meeting room, preferably each with a large-screen monitor so those who are not at the keys will nonetheless stay involved.

* Gather as large a variety of appropriate gear as possible to display the various options from which your newcomers will soon

have to choose. For example, a Commodore C 64 with a TNC, black-and-white portable TV "monitor" (check first for TVI) and a bare-bones 2-meter handitalkie),

or

the battery-operated portable packet station (for example, a TRS-80 Model 100, a TAPR TNC 2, a simple homemade C-cell battery power supply and a typical, small 2-meter HT. Don't forget the typical home station (for example, a personal computer like an Apple //e or IBM PC, any compatible TNC and a modern mobile or desktop 2-m rig).

Redundancy

Have a few extra TNCs, 12-V power supplies, 2 meter radios and computers available on site -- with the necessary interfacing cables! If any of the primary station components should crash, you'll be able to swap out "black boxes" immediately. Yes, we know this is asking a lot, but try to get as close to this ideal as you can given your local resources and sophistication. Don't forget that Murphy lies in the wings, poised to strike at the first opportunity. As any experienced ham (particularly a contester) can confirm, the likelihood of something going wrong at a particular moment is inversely proportional to the ease with which you can fix the problem at that moment, and directly proportional to the importance of its working correctly.

Scheduling and Ring-Out

Make sure that a few scattered packet stations are manned and standing by at the appointed hour. A day or two and again roughly an hour before your meeting, check to see that the local digipeater is working. Likewise, run the local PBBS and any other normally accessible bells and whistles through their paces.

Rehearsal

A smooth demonstration will do a lot to convince your future fellow Packeteers that packet radio really is simple, and that you're not. Put in the time. Yes, it's hard work. But doing it right the first time will ensure that the first time will be your last time. Ideally, everyone will agree to a dry run a couple of weeks before D-Day. Certainly, the on-site crew must take the time to make all the mistakes "backstage."

The Sequence

Start simple and follow a logical progression to arrive at routine packet-radio operation. Start with a single station. Connect with yourself. Note that the person speaking should not be the one plying the keyboard; also, the operator at the keys should not run ahead of what the narrator is explaining. That alone should take a little practice to perfect.

Keep the focus in the room for a few minutes while you explain the basics of firing up the equipment and establishing a connection. Next, connect with a station across the room and converse for a while. Then connect with a third station via Station #2.

To further the pretense that everyone can keep tabs on every one else, minimizing the apparent magic, demonstrate the advantages of packet radio over other digital modes. What happens if the link between two connected stations breaks down for a while? What if the signal suddenly falls into the noise or there's very strong interference? How could reliable communications ever be conducted via meteor scatter, so transient a phenomenon? A simple way to simulate the "band" falling out for a few seconds -- disaster for CW or ASCII transmissions -- is to walk over to the radio at Station #2 and turning off the radio. Make sure that another rig is monitoring the frequency with the audio turned up. Station #1 keeps trying to reach Station #3 via Station #2; no such luck. Turn the radio back on in 15 or 20 seconds. Voila! With a little creativity you should be able to devise some clever simulations yourself.

Next, turn the focus to the world beyond your cozy meeting room. Link to another station in the room but via a local digipeater. Then turn to your busy local packet frequency and leave a station in the room in monitor mode; let everyone observe what's going on in the real world. Next, pass out network maps, if they exist for your area. Don't forget that to your audience, knowing what sequence of stations to link through to reach a given destination seems as far fetched as copying 1200 bit/s ASCII by ear!

Finally, turn them loose! Have a control operator/tutor/Elmer at each station to show them once again how to play the game and let each guest do his thing for five minutes or so. (It helps to have kept the coffee hot in anticipation of the friendly chaos that will ensue.) Observe the rules, especially when control operating for non-ham guests.

If you get this far without any casualties, you've got it licked. All that's left is to regain loose control of the festivities, and sustain the enthusiasm by letting them propose and work out pie-in-the-sky applications of their new-found obsession. We'll cover this next time.

From WB1EYI

TNC 2 Update

"Noting the improvements made in the TNC 2 Rev 2 design, many of you have contacted TAPR requesting information on obtaining parts for the various upgrades listed in the October, 1985 PSR Quarterly.

After listening to your calls and reading your letters, we are pleased to announce that we are ordering sufficient parts to send to every TNC 2 Rev 1 owner a "care package" consisting of the 27C256 EPROM, second 8k static RAM, RF Chokes and miscellaneous capacitors, along with a corrected copy of the PSR article.

If all goes well, the package should arrive in time to be a stocking stuffer.

The price? Hey, this is TAPR. There will be no charge...

Thank you for your support. Happy holidays from TAPR!"

From TAPR

Work Continues On SAREX II

"Many of you are aware that we are hard at work to get SAREX II built. SAREX II is an acronym for Shuttle Amateur Radio EXperiment; SAREX I was the slow-scan TV that W0/ORE used earlier this year.

SAREX II is to be a packet-radio package consisting of a flight-hardened TAPR TNC 2 coupled to a Radio Shack Model-100 lap-top computer and the same Motorola "MX" series HT used on previous Amateur Radio shuttle flights.

We are striving, pending approval from NASA, to have this hardware carried by Ron Parise, WA4SIR, when he flies on mission 61-E taking off March 6, 1986. The crew working on hardware and software to make this happen are located in Maryland, Arizona, Florida, Texas, Arizona and Iowa.

We now have prototype SAREX II software operating on 145.05 in the Balto/Wash area under the call W3IWI-5. It is under test to see if local users can make it croak! It has several unique features:

ROBOT -- This is an automatic QSO machine that will work you and assign you a unique serial number (in hex) for your QSO, and then disconnect.

WORKED beacon -- If you successfully complete a QSO, your call and serial number will appear at the top of the "WORKED" beacon list. For local testing this (and other) beacons are being sent every 15 minutes. In flight they will be repeated every 15 seconds or so.

HEARD beacon -- This beacon begins with a beacon sequence number (to help piece the log together in flight) and lists the calls heard most recently.

A normal beacon (currently addressed to SAREX II) is also used to send a brief (up to 120 bytes) information packet.

A "meta-beacon" is also available (but is currently turned off) to send up to 1.7 kbytes (7 * 255 bytes) of information. It is planned that this feature will be used in flight to downlink a mission status bulletin every couple of minutes or so.

These features have been designed to permit a large number of packeteers to experience the thrill of space communications even if WA4SIR is not personally available.

During the mission, some time will be reserved for special packet tests including an orbital demo of store-and-forward communications (a la PACSAT); software to support this special mode is to be housed in the Model 100.

The ROBOT supports multiple QSO's simultaneously. Balto/Wash users are invited to become abusers and to try to crash the test software. Gang up on W3IWI-5. Lambaste it with simultaneous packets. Try to make it croak. Make my day!!! Meanwhile, W3IWI-5 will also continue to serve as a local coverage digipeater from its location at NASA/Goddard in Greenbelt, Maryland.

Reports on how it works will be appreciated. Especially solicited are bug reports which should contain as much info as possible on what happened. It's a lot easier to fix it on the ground than when it is flying in orbit!"

From W3IWI

MFJ Announces TNC

MFJ has announced a TNC 2-type packet controller to be available to the general public in February of 1986. Suggested retail price for the wired and tested unit is $129.95!

Via HamNet

ARRL DIGITAL COMMITTEE MEETING

The ARRL Ad Hoc Committee on Amateur Radio Digital Communications held a meeting in Newington, CT, on December 7th and 8th. Among topics discussed were:

- Networking
- Congestion on the frequencies
- Preparation for Orlando Hamcation
- HF Packet Radio
- Digital radios

More information on the meeting will be printed in the next issue
of Gateway.

REPRODUCTION OF GATEWAY MATERIAL

Material may be exerpted from Gateway without prior permission, provided that the original contributor is credited and Gateway is identified as the source.

From -6557687469318653644
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d7190eb93a193c27
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-12-31 08:47:08 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site mcnc.mcnc.UUCP
Path: utzoo!linus!decvax!mcnc!jwb
From: jwb@mcnc.UUCP (Jack W. Buchanan Jr.)
Newsgroups: net.ham-radio.packet
Subject: Re: TNC-2 controllers
Message-ID: <1069@mcnc.mcnc.UUCP>
Date: Tue, 31-Dec-85 11:47:08 EST
Article-I.D.: mcnc.1069
Posted: Tue Dec 31 11:47:08 1985
Date-Received: Wed, 1-Jan-86 04:46:31 EST
References: <35640@lanl.ARPA>
Reply-To: jwb@mcnc.UUCP (Jack W. Buchanan Jr.)
Distribution: net
Organization: Microelectronics Center of NC; RTP, NC
Lines: 32
Summary:

There appears to be a price war brewing on TNC-2 contollers. My question is:

Which controllers provide complete documentation ? I would define complete documentation as everything which was provided with the TAPR kits (except maybe the board stuffing instructions if they were separate) plus whatever the manufacturer/distributor thinks is helpful. A related question: Is the TAPR documentation available separately ? How much does it cost ?

A mild flame:

For some time I have been wanting to try to develop my own TNC using some (Intel) HDLC chips which are available to me. In spite of the wonderful claims about info on packet which was going to appear in QST and elsewhere, I have seen minimal technical information other than the protocol document itself. I don't want to see "Thrills and Chills of Packet Operating" and "How Wonderful is Packet". I want to see a schematic or at least a block diagram of typical hardware approaches. I want to see some source code in any language for any microprocessor and/or HDLC chip so I can get some ideas. I would like

to see the command structure of any working packet system so I don't leave anything out if I roll my own. I realize the proceedings of the ARRL symposia have some information, but most of that is how to link digipeaters in Florida or Georgia. What happened to the homebrew spirit beyond the rank novice in ham radio?

     Jack Buchanan K4FRS
     Medicine and Biomedical Engineering
     UNC-Chapel Hill
     {decvax, akgua}!mcnc!jwb
or   "   "   mcnc!ecsvax!jwb (prefered mail address; ecsvax doesn't
                          net.ham-radio.packet so I couldn't
                          post this over there)
     ARPA or CSNET: something like jwb.MCNC@csnet.arpa

From 6791936203813608995
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,b0696919e5d39048,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-05 09:25:36 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site cp1.UUCP
Path: utzoo!linus!decvax!genrad!panda!talcott!harvard!seismo!umcp-cs!aplcen!cp1!
hart
From: hart@cp1.UUCP (rod hart)
Newsgroups: net.ham-radio.packet
Subject: Re: GLB TNC
Message-ID: <1132@cp1.UUCP>
Date: Sun, 5-Jan-86 12:25:36 EST
Article-I.D.: cp1.1132
Posted: Sun Jan 5 12:25:36 1986
Date-Received: Tue, 7-Jan-86 06:53:41 EST
References: <875@mit-eddie.UUCP>
Reply-To: hart@cp1.UUCP (Rod Hart)
Organization: C & P Tel. Co., Baltimore, Md.
Lines: 30

I too was shorted one (1) 74hct107 xmit
clock chip, but was able to fire up the
unit using a 74ls107. The TNC went to-
gether as advertised without a hitch.
Even though the operation manuals are
backordered, I was able to use the unit.
There is a problem with a spur right on
145.010, but I was told by Ed at GLB the
fix is a minor clock adjustment that is
explained in the missing manual. True, I
have had a few problems, but I am pleased
with the quality and functionality of the
GLB/TAPR TNC2 and would recommend it. What
a difference from my OLD Vancouver, it
has been sort of like changing from a

world war I biplane to an f15.--

==========
Signed by:
  Rod Hart (WA3MEZ)
  Minicomputer Technical Support District
  Chesapeake & Potomac Tel. Co.
  A Bell Atlantic Company
  Silver Spring, Md.
  UUCP:
  aplvax!cp1!hart - aplcen!cp1!hart - umcp-cs!cp1!hart - gamma!cp1!hart
  INTERNET:
  umcp-cs!aplvax!cp1!hart@SEISMO.CSS.GOV
==========

From -2924570100367167708
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,b59b8343fa92d08b,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-07 09:44:12 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.3 4.3bsd-beta 6/6/85; site decwrl.DEC.COM
Path: utzoo!linus!decvax!decwrl!dec-rhea!dec-star!los
From: los@star.DEC (Edward J. Los)
Newsgroups: net.ham-radio.packet
Subject: Packet modem
Message-ID: <302@decwrl.DEC.COM>
Date: Tue, 7-Jan-86 12:44:12 EST
Article-I.D.: decwrl.302
Posted: Tue Jan 7 12:44:12 1986
Date-Received: Wed, 8-Jan-86 20:16:59 EST
Sender: daemon@decwrl.DEC.COM
Organization: Digital Equipment Corporation
Lines: 9

.

     Does anybody have information on the Singer 2400 BPS modem, Model 883P?
I rescued this modem from a friend's junkbox for possible use on packet radio
but have no specs or installation guide.

                                        Ed, KB1JG

From 2926546141970113782
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,a459c414a0c4363f,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-07 14:24:17 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP

Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!crash!bblue@nosc.ARPA
From: bblue@nosc.ARPA
Newsgroups: net.ham-radio.packet
Subject: add to list
Message-ID: <892@mit-eddie.UUCP>
Date: Tue, 7-Jan-86 17:24:17 EST
Article-I.D.: mit-eddi.892
Posted: Tue Jan 7 17:24:17 1986
Date-Received: Thu, 9-Jan-86 06:28:00 EST
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 4

From: crash!bblue@nosc.ARPA
Please add us to your mailing list: crash!packrad@nosc

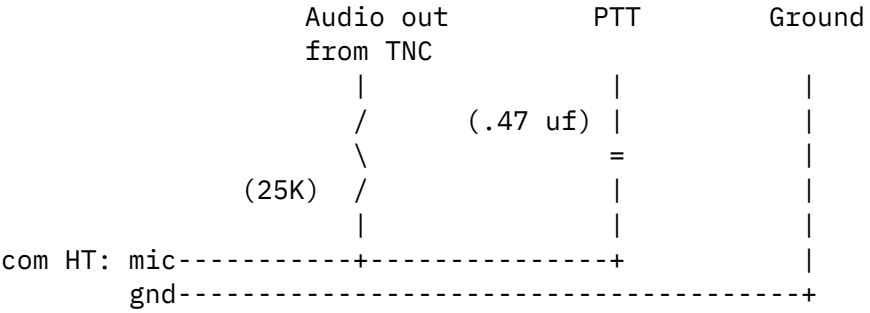
Thanks.   --Bill Blue   crash!bblue@nosc

From -4016182019895675753
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,62f66764ce82acb9,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-10 15:49:59 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!bonnie!akgua!akguc!mtunh!ky2d-2!ka2ugq
From: ka2ugq@ky2d-2.UUCP (Tom)
Newsgroups: net.ham-radio.packet
Subject: Schematic of TNC to ICOM HT
Message-ID: <94@ky2d-2.UUCP>
Date: Fri, 10-Jan-86 18:49:59 EST
Article-I.D.: ky2d-2.94
Posted: Fri Jan 10 18:49:59 1986
Date-Received: Tue, 14-Jan-86 04:52:37 EST
References: <93@ky2d-2.UUCP>
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 31

> Would one of you be kind enough to mail the info to me
> regarding the use of an icom 2AT with a tnc. I seem to
> remember it on the net before but unfortunatly didnt
> save the article.
>   thanks in advance.....johnd
>
> UUCP: {ucbvax,decvax,ihnp4}!vax135!petsd!pedsga!johnd
> PACKET RADIO GATEWAY: ....!mtunh!ky2d-2!ka2qhd tnx de KA2QHD
> ==

Here is the schematic that I used to interface my GLB PK-1 to an
Icom IC-2AT HT, but it should work with any TNC and the Icom 02AT

or 2A just as well.



-Tom Brown KA2UGQ

  uucp: ..!ihnp4!bellcore!mtunh!ky2d-2!ka2ugq
    or: ..!ihnp4!bellcore!ka9q!tom
Packet: KA2UGQ @ WA2SNA-1
  bomb: 40 41 N, 74 25 W

From 9144577363218190468
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,568cbc1ada5e7f8e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-14 11:45:11 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site lanl.ARPA
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxt!houxm!ihnp4!cbosgd!ukma!
psuvm.bitnet!psuvax1!burdvax!sdcrdcf!hplabs!intelca!qantel!lll-crg!seismo!cmcl2!
lanl!tl
From: tl@lanl.ARPA
Newsgroups: net.ham-radio.packet
Subject: Used 2 meter gear
Message-ID: <36559@lanl.ARPA>
Date: Tue, 14-Jan-86 14:45:11 EST
Article-I.D.: lanl.36559
Posted: Tue Jan 14 14:45:11 1986
Date-Received: Sun, 19-Jan-86 05:44:53 EST
Distribution: net
Organization: Los Alamos National Laboratory
Lines: 6

*Hi. I am looking for a used 2 meter xcvr so that I can get on 145.01mHz.
If any of you know where I can get a used rig or if you have one to sell,
please drop me a line. I sure don't want to drop the bucks for a new radio
when even an old xtal rig will do what I need.
  Thanks and Vy 73 de Terry, WA5ZKP
** REPLACE THIS LINE WITH YOUR MESSAGE ***

From -6657387604743406155
X-Google-Language: ENGLISH,ASCII-7-bit

X-Google-Thread: 11bd51,b1ac93b8e0ff0fb1,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-18 11:28:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: Notesfiles $Revision: 1.7.0.10 $; site techsup
Path: utzoo!watmath!clyde!cbosgd!ihnp4!inuxc!pur-ee!uiucdcs!convex!techsup!mikey
From: mikey@techsup
Newsgroups: net.ham-radio.packet
Subject: Re: [Ralph.Hyre@IUS2.CS.CMU.EDU:]
Message-ID: <-56768541@techsup>
Date: Sat, 18-Jan-86 14:28:00 EST
Article-I.D.: techsup.-56768541
Posted: Sat Jan 18 14:28:00 1986
Date-Received: Wed, 22-Jan-86 05:42:30 EST
References: <926@mit-eddie.UUCP>
Lines: 22
Nf-ID: #R:mit-eddie.UUCP:926:techsup:-56768541:000:1115
Nf-From: techsup!mikey   Jan 18 13:28:00 1986

The setteling time on the 8530 is a certain number of t states +200nsec.
It depends on your clock as to what the setteling time ends up being.
It is actually called valid access recovery time or something like that.
Where it can really burn you is if you use DMA on the 8530, you must make
sure that DMA on read transfers are held up by the setteling time after a
normal access. On DMA writes to the chip, you will probably have to
generate waits. If you don't use DMA, everything else can be handeled in
software. Just make sure that any access to the chip isn't at the very
front or tail end of an ISR. Usually, stack saves and restores are
enough to take cake of this, but remember, an interupt can occur while you
are doing another access, so pad the ISR accordingly.

Finally, I believe it is the secondary DMA pin on the chip has different
timing characteristics than the primary pin. It has something to do with
the fact that it is really a status pin for the holding register and it's
status may lag behind what is really happening by a few hundred nsec.

mikey N1DVJ
trsvax!techsup!bbimg!mikey

From -5089825059338993891
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,1f6b877b5b9b30e1,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-19 19:57:19 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site uthub.UUCP
Path: utzoo!utcsri!utai!uthub!dunc
From: dunc@uthub.UUCP (Duncan Elliott)
Newsgroups: net.ham-radio.packet

Subject: CQ Packet .. via satellite
Message-ID: <251@uthub.UUCP>
Date: Sun, 19-Jan-86 22:57:19 EST
Article-I.D.: uthub.251
Posted: Sun Jan 19 22:57:19 1986
Date-Received: Mon, 20-Jan-86 00:42:16 EST
Distribution: net
Organization: CSRI, University of Toronto
Lines: 11

Do any hams send out CQ's on packet via satellite? What modes are used --
1200 bits/s FSK SSB (F1)?

Could any hams on this net give me schedules of regular packet radio
transmissions via satellite which I could eavesdrop on (including
inter BBS traffic).
              Thanks.

             Duncan Elliott University of Toronto, Dept. EE
             VE3PKD (VE3UOT club)
             {linus,ihnp4,uw-beaver,floyd,utzoo}!utcsri!uthub!dunc

From -5065723788897487989
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f2407062444432ef,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-19 22:24:13 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!decwrl!pyramid!ut-sally!
seismo!rochester!ritcv!cxs6277
From: cxs6277@ritcv.UUCP (Cliff Skolnick)
Newsgroups: net.ham-radio.packet
Subject: Packet xfer
Message-ID: <9262@ritcv.UUCP>
Date: Mon, 20-Jan-86 01:24:13 EST
Article-I.D.: ritcv.9262
Posted: Mon Jan 20 01:24:13 1986
Date-Received: Thu, 23-Jan-86 21:03:56 EST
Reply-To: cxs6277@ritcv.UUCP (Cliff Skolnick)
Distribution: net
Organization: Rochester Institute of Technology, Rochester, NY
Lines: 8

x
     Is there anyone out there who has any good ideas on transfering
.com files via packet on two IBM PC's? We have tried xmodem, but the
delays seem to always abort the xfer. It there any protocal that does
not care about time delays?
     Cliff Skolnick

{allergra, Seismo}!rochester!ritcv!cxs6277

From 2474475541132544408
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f2407062444432ef
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-23 09:46:25 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site omen.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!decwrl!pyramid!hplabs!
tektronix!reed!omen!caf
From: caf@omen.UUCP (Chuck Forsberg WA7KGX)
Newsgroups: net.ham-radio.packet
Subject: Re: Packet xfer
Message-ID: <288@omen.UUCP>
Date: Thu, 23-Jan-86 12:46:25 EST
Article-I.D.: omen.288
Posted: Thu Jan 23 12:46:25 1986
Date-Received: Sat, 25-Jan-86 08:38:20 EST
References: <9262@ritcv.UUCP>
Reply-To: caf@.UUCP (Chuck Forsberg WA7KGX)
Distribution: net
Organization: Omen Technology, Portland
Lines: 23

In article <9262@ritcv.UUCP> cxs6277@ritcv.UUCP (Cliff Skolnick) writes:
>x
>   Is there anyone out there who has any good ideas on transfering
>.com files via packet on two IBM PC's? We have tried xmodem, but the
>delays seem to always abort the xfer. It there any protocal that does
>not care about time delays?
>   Cliff Skolnick
>
>{allergra, Seismo}!rochester!ritcv!cxs6277

SuperKermit (Kermit with Sliding Windows) should do the trick. SuperKermit
allows up to 31 packets to be in transit.

You can download YAMDEMO.LQR from Telegodzilla; this includes the SuperKermit.
YAMHELP.LQR also available on Telegodzilla contains a tree structured
flash-up help processor for YAMDEMO.

--
   Chuck Forsberg WA7KGX ...!tektronix!reed!omen!caf   CIS:70715,131
   Author of Professional-YAM communications Tools for PCDOS and Unix
 Omen Technology Inc   17505-V NW Sauvie Island Road Portland OR 97231
Voice: 503-621-3406 TeleGodzilla: 621-3746 300/1200 L.sys entry for omen:
omen Any ACU 1200 1-503-621-3746 se:--se: link ord: Giznoid in:--in: uucp

From -8794811661513224936
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,a7f30b4fe07ed97f,start
X-Google-Attributes: gid11bd51,public

X-Google-ArrivalTime: 1986-01-23 18:36:21 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site inuxi.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!inuxc!inuxi!wheatley
From: wheatley@inuxi.UUCP (Steven Wheatley)
Newsgroups: net.ham-radio.packet
Subject: GATEWAY V 2, NO 10
Message-ID: <278@inuxi.UUCP>
Date: Thu, 23-Jan-86 21:36:21 EST
Article-I.D.: inuxi.278
Posted: Thu Jan 23 21:36:21 1986
Date-Received: Fri, 24-Jan-86 22:24:50 EST
Distribution: net
Organization: AT&T Consumer Products, Indianapolis
Lines: 406

Gateway: The ARRL Packet-Radio Newsletter
Volume 2, Issue 10
January 10, 1986

Published by:
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Editor:
Ed Raso, WA2FTC

CANADIAN PBBS

David Toth, VE3GYQ, reports that a new PBBS is operational in London, Ontario. The PBBS is operating under the call of VE3GYQ, and is forwarding messages between the eastern U.S. and the VE3FXI PBBS in Ottawa. David can also forward messages to the N8BMA PBBS in Detroit, MI and the AD8Y, PBBS in Ann Arbor, MI. David's plan is to use a second port on his PBBS for the 145.09 MHz LAN, (Local Area Network) and keep the primary port on 145.01 MHz.

Via HamNet

PACKET RADIO DOWN UNDER

Brian Wendt, VK4ATI, reports that a group of 15 amateurs in Brisbane, Australia are now involved with packet radio. The group will begin regular club meetings after the first of the year, and hopes to have a PBBS operating within a short time

Ed.

LANDLINE PACKET BBS

A new landline BBS operated by Packet Of New York is now in operation. The system is intended to assist New York City hams interested in packet radio and other forms of digital communications. The phone number of the system is (212) 250-7090, and is in operation 24 hours a day, except during periods of maintenance. The BBS uses 8 bits, no parity, and 1 stop bit. The system supports both 300 and 1200 bit/s operation, and "auto-bauds" on two carriage returns.

Via HamNet

TNC 2 FIXES

If you are planning on using your TAPR TNC 2 on HF, take note of the following problem. A "birdie" may appear every seven kHz on the HF bands. This is caused by the 556 Oscillator/Timer U2. To correct this problem, place a bypass capacitor between pins 3 and 7 and pins 11 and 7 of U2. The value of the capacitor does not seem to be critical, and can be between 0.22 uF and 0.1 uF. This procedure should clear up the problem.

The following information applies only to TNC 2 Rev 2. Symptom: The digital loopback test on pages 47 and 48 of the TAPR TNC 2 ASSEMBLY MANUAL fails. No CONNECTED message is displayed, or is intermittent. Solution: change R98 from a 4.7 k to a 100 k resistor. Change C10 from a 10 uf to a 47 uf capacitor. Remember, these mods are for TNC 2, Rev 2 units only.

Via HamNet

KANTRONICS vs. TAPR HF FREQ.

"It is sometimes confusing to Kantronics users to understand why they are not on the same HF frequency as TAPR users. The reason is that the TAPR design uses a low tone of 1600 Hz and a high tone of 1800 Hz. The Kantronics TNC is using a tone pair of 2025 Hz/2225 Hz. As you can see, this tone pair is exactly 425 Hz higher then the pair used in the TAPR TNC. Since the tones are 425 Hz higher, you must tune your transceiver 425 Hz higher to compensate."

From PacketEar

NNC PROTOTYPE DEBUGGING PROGRESS

We received this status report from Lyle Johnson, WA7GXD, on

the status of the Network Node Controller (NNC).

"The NNC prototype testing is progressing fairly smoothly. The test unit is chugging away at a system clock of 4.608-MHz (due to CMOS Z80 A peripherals being available, while B parts are not).

"Using test code provided by N2WX, I have verified the operation of one channel of 1 SIO running HDLC data in a digital loopback mode at a data rate of 76.8kbit/s (it can't hack 153.6k bit/s in fulldup with the test code). This is polling, not interrupt-driven. I have also verified that I can talk to both channels of both SIO/2s.

"Similarly, I have verified that I can talk to both channels of the PIO and ran a simple test program tonight to drive a `Centronics' printer.

"I have also written data to and read data from the SCSI chip (5380) but it is basically gibberish.

"Finally, I have patched the BIOS to support the 4.608-MHz clock rate and all the software I have written/used is running on the NNC prototype.

From WA7GXD

SOME THOUGHTS ON BEACONING

"In the last couple of months I've noticed something that is very upsetting. As the growth rate on our packet-radio network continues to explode, some very bad operating habits have emerged. It's not the newcomers fault, it's the rest of us, the `old-timers,` who are to blame.

"As I watch our local packet frequency (145.01 MHz) my screen fills with beacons, one station sends his telephone number every 10 minutes, and digipeats it to boot. We have attempted in vain to forward traffic from the local W0/RLI PBBS system to another north of us just three digis away. We can't make it, even in the dead of night! Our channel is backed up with redundant beacons. How did I come to the conclusion that the newcomers are not to blame? Simple, they copy the old pros.

"I'm not going to argue about how one person's beacon's are `valid` and others are not. Simply put, if you beacon you add to the confusion and limit our effectiveness. A true computer network does not do such things. Sending unconnected frames into space proves very little. Why not put the beacon traffic on your local PBBS.

"The Packet community was quick to dump the CW ID; it served no useful purpose. Beacons in the early days were useful because stations were far apart, and routing to distance packeteers was unknown. Now most PBBSs have maps of entire states, including the entire east and west coasts. Make a hard copy and put it on your wall. Your local area does not have a map? Sit down and put one together and upload it to the local PBBS (if you can get thru the QRM).

"There are other operating techniques that are important: PACLENGTH, FRACK, DWAIT, and the like. I've just mentioned one that is destroying a perfectly good mode of operation.

"I'm sure the Christmas holidays brought quite a few folks packet controllers. These new ops will eagerly jump on the network. Will they find a usable system, or an environment that leads to frustration?

"Please turn BE to 0 and set the example. Remember, each packet station forms a vital part of the network. If you are not part of the solution then you are part of the problem.

From WB9FLW

IOWA GROUP TESTS SAREX-2 TNC SOFTWARE

"The Central Iowa Technical Society (CITS), with the help of many Midwest packet-radio operators, has completed testing of terminal node controller (TNC) software destined to be part of the next Shuttle Amateur Radio Experiment (SAREX-2). This major component of our next manned amateur radio operation in space has proven to have the potential of thousands of packet-radio QSOs with ground stations around the world.

"Software was written by Howard Goldstein, N2WX, of Palm Bay, FL and tested in a Tucson Amateur Packet Radio Corporation (TAPR) TNC 2 (Rev 2). It follows SAREX-2 system architecture developed by a team lead by Dr. Tom Clark, W3IWI, of the Radio Amateur Satellite Corporation (AMSAT). CITS members provided an intensive test environment by flying the SAREX-2 packet-radio system in an aeronautical mobile operation, thereby allowing ground stations in several Midwest states to provide a significant load test.

"Several new packet-radio operating capabilities are available in Howard's SAREX-2 TNC 2 software which required evaluation.

- A `ROBOT` capability allows up to nine simultaneous packet radio QSOs with ground stations with each QSO meeting amateur radio requirements for information transfer and acknowledgement.

- The SAREX-2 operator can create `META` beacons containing up to seven packets of up to 255 bytes of text each allowing up to 1785 bytes of bulletin information to be repeatedly transmitted on the downlink every 215 seconds.

- HEARD beacons containing up to 25 call signs from monitored packets can be used by ground stations to immediately determine if their packets are being copied in the shuttle, will be used by the SAREX-2 logging scheme to develop a list of all stations HEARD during the mission.

- WORKED beacons containing up to 17 call signs and QSO serial numbers of stations with whom successful QSOs have been made can be used by groundstations to determine if they have just completed a successful QSO, will be used by the SAREX-2 logging scheme to develop a list of all stations WORKED during the mission.

"Through the efforts of Tom Clark in Washington, D C and TAPR in Tucson, AZ, PROMs containing Howard's SAREX-2 TNC 2 program were received in Iowa a few days after Howard released his code. Ten Des Moines area packeteers performed a limited test which yielded over 400 ROBOT QSOs in one hour. This initial operation prepared the group for the more intense aeronautical test which followed.

"On Wednesday, December 11th, CITS members Larry Vandewater, N0/BKB, Rich Amundson, WA0/JFS, and Ray Knapp, WA2GTM, were off the ground with the SAREX-2 system shortly after 1900 CST. At the same time, Ralph Wallio, W0/RPK, opened information nets on 3857 and 1955 KHz to announce test progress and answer operating questions. A UHF FM link was maintained with the aircraft which proved its value toward the end of the flight.

"The first SAREX-2 QSO occurred almost immediately and load increased as the aircraft gained altitude. Although the SAREX-2 software allowed nine simultaneous QSOs, several ground stations reported receiving BUSY responses to their CONNECT attempts. Obviously, this was a very busy system.

"During this one-hour test, several ground stations collected packets heard on the `downlink` frequency into disk files which, at the end, contained approximately 154 kbytes of packets.

"During a measured hour of this test, the system allowed 502 successful QSOs which is considered to be near its maximum capability.

"Toward the end of the first hour of what was supposed to be a two-hour mission, the aircraft developed mechanical problems. The two highly qualified pilots aboard decided to

reduce altitude which meant the flight never made it to 10,000 feet. Unfortunately, this reduced the operating range to approximately 175 miles eliminating participation by expectant packet radio operators in the larger but more distant metropolitan areas of Minneapolis - St. Paul, Chicago and St. Louis.

"As the aircraft descended toward the Greenfield airport, the mechanical problem became more serious finally resulting in a dead-stick landing with the prop totally stopped (the last UHF FM transmission heard was `... we are a glider`).

"The landing was uneventful, albeit quiet, but the end of the landing roll left the aircraft and SAREX-2 test crew a long way from the hanger on a cold Iowa night. Fortunately, the aircraft was equipped with several forms of two-way radio and a Greenfield police vehicle was soon on the scne. It was a few days before the news was out that a 3/4-inch hole was burned into the wall of a cylinder allowing an almost total loss of oil and causing total failure of the engine."

From W0/RPK

CALL FOR PAPERS

The ARRL will hold its Fifth Amateur Radio Computer Networking Conference on Sunday, March 9, 1986 in Orlando Fl. The conference will be hosted by the Florida Amateur Digital Communications Association, and held in conjunction with the ARRL Florida State Convention being held that same weekend.

The deadline for receipt of camera ready papers is February 1, 1986. Contact Paul Rinaldo, W4RI, at ARRL HQ for information on submitting papers.

From W4RI

DIGITAL COMMITTEE MEETS

On the weekend of December 7-8, 1985, The Ad Hoc Committee on Amateur Radio Digital Communications met at ARRL HQ. There was general agreement that the current number one problem in packet radio is channel congestion. This recognizes that 1200 bit/s is already too slow to handle the amount of traffic on a single channel such as 145.01 MHz. Utilizing 9600 bit/s would only ease the situation for a year or so. The Committee recognized that congestion could be eased by more channel space, such as using 145.01, .03, .05, .07 and .09 MHz. A move to higher frequencies where adequate space is available would ease congestion on 145 MHz. Greater intercity trunk capacities are also possible using full duplex.

The Committee would be interested in hearing other ideas and implementations that could be used to solve this problem.

Ed.

PBBS LIST

The following stations run PBBSs of one nature or another. All are linked by way of automatic forwarding.

W1AW-4, Newington, CT (ARRL HQ station)
K1BC, Lexington, MA (145/220 GateWay)
N1DL, Sudbury, MA (HF/VHF GateWay)
KE1G-1, Goffstown, NH
N1DKF, Cranston, RI (145/220 GateWay)
WB1DSW, E. Kingston, NH
WA1LRL, Brighton, MI (HF/VHF GateWay)
KD1R-1, Milton, VT
W1ZHC, Mattapoisett, MA
KC2FF, Tampa, FL
WA2FTC-1, Newington, CT (HF/VHF GateWay)
WB2MNF, Medford, NJ
AI2Q, Freeport, NY
WA2RKN-2, Hyde Park, NY
WB2RVX, Pennsauken, NJ
WA2SNA-1, Wayne, NJ
KC2TN, Atco, NJ (HF/VHF GateWay)
WA2VKH, Carlstadt, NJ
N2WX-1, Palm Bay, FL
KC3BN, Harrisburg, PA
KC3BQ, Skaneateles, NY
WB3EYB, Harrisburg, PA
K3GYS, Atco, NJ
W3IWI, Clarksville, MD (145.01 / 145.05 GateWay)
K3MC, Pittsburgh, PA
AK3P, Hummelstown, PA
KS3Q, Baltimore, MD
WA3QFN, Margate, FL
K3RLI, Wilkes Barre, PA
W3TMZ, Mount Airy, MD
W3VH, Arlington, VA
K3VPZ, Granite, MD (HF/VHF GateWay)
K4AHO, Orlando, FL (HF/VHF GateWay)
WD4BRF, Stuart, FL
N4CI, Atlanta, GA
KB4CIA, Port Charlotte, FL
K4EID, Knoxville, TN (HF/VHF GateWay)
KF4JF, Hahira, GA (HF/VHF GateWay)
NK4K, Miami, FL
W4KAU, Cohutta, GA

KD4NC, Sweat Mtn., TN
K4NGC, Woodbridge, VA
K4NTA, Stuart, FL (HF/VHF GateWay)
KC4OI, Powell, TN
K4OZS, Ocala, FL
WX4S, Johnson City, TN
WA4SZK, Florence, SC (HF/VHF GateWay)
K4TKU, Miami, FL (HF/VHF GateWay)
KI4XO, Marietta, GA (HF/VHF GateWay)
WB4ZNW, Moultrie, GA
WB5BBW, Houston, TX
WA5MWD, Garland, TX
WB5VUL-1, Palo Alto, CA
W5XO, Gause, TX (HF/VHF GateWay)
W6CUS-1, Richmond, CA
WA6ERB, Lakewood, CO (HF/VHF GateWay)
KD6SQ, Rancho Cucamonga, CA (HF/VHF GateWay)
KE7CZ, Dewey, AZ
WB7DCH, Enumclaw, WA (HF/VHF GateWay)
K7PYK, Scottsdale, AZ (HF/VHF GateWay)
N8BMA, Detroit, MI (145/220 GateWay)
KB8CI, Cleveland, OH
N8FJB, Harpers Ferry, WV
WB8WGA, Gahanna, OH (HF/VHF GateWay)
WB8WKA, Southfield, MI
AD8Y, Ann Arbor, MI
K0/HOA, Colorado Springs, CO (HF/VHF GateWay)
WA0/JFS-1, Des Moines, IA
KC0/OJ, Battle Creek, IA
NA0/P, Ames, IA
KI0/Q, Ames, IA (HF/VHF GateWay)
KC0/QJ, Walsenburg, CO (HF/VHF GateWay)
W0/RLI, Westford, MA   (145/HF GateWay)
W0/RLI-1, Westford, MA (145/220 GateWay)
NA0/S, Ames, IA
AI0/Z, Roland, IA
LA6OCA, Skien, Norway
VE3FXI, Ottawa, ON
VE3GYQ, London, ON
ZF1GC, Grand Cayman Is.

     From W0/RLI

REPRODUCTION OF GATEWAY MATERIAL

Material may be exerpted from Gateway without prior permission,
provided that the original contributor is credited and Gateway is
identified as the source.

[EOF]

From -1012684812652513489
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f2407062444432ef
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-24 06:14:42 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site uthub.UUCP
Path: utzoo!utcsri!utai!uthub!dunc
From: dunc@uthub.UUCP (Duncan Elliott)
Newsgroups: net.ham-radio.packet
Subject: Re: Packet xfer
Message-ID: <252@uthub.UUCP>
Date: Fri, 24-Jan-86 09:14:42 EST
Article-I.D.: uthub.252
Posted: Fri Jan 24 09:14:42 1986
Date-Received: Fri, 24-Jan-86 11:58:56 EST
References: <9262@ritcv.UUCP>
Distribution: net
Organization: CSRI, University of Toronto
Lines: 14

> Is there anyone out there who has any good ideas on transfering
> .com files via packet on two IBM PC's?
> {allergra, Seismo}!rochester!ritcv!cxs6277 <9262@ritcv.UUCP>

If you're sending a single file to someone who is waiting to receive it, then why not just send it in the AX.25 data link layer.

The data link layer supports transparent data (any arbitrary binary sequences). The weakest link may be getting the .COM file between your computer and your TNC. If your TNC won't let you send transparent data, you may want to convert it to hexadecimal as is done in the Binhex or Motorola S-record formats.

Duncan Elliott University of Toronto, Dept. EE
{linus,ihnp4,uw-beaver,floyd,utzoo}!utcsri!uthub!dunc

From 7372412311001212990
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,63d616256e29d513,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-24 09:14:16 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site burl.UUCP
Path: utzoo!watmath!clyde!burl!ars
From: ars@burl.UUCP (ars)
Newsgroups: net.ham-radio.packet
Subject: USING A PC AS A TNC
Message-ID: <971@burl.UUCP>
Date: Fri, 24-Jan-86 12:14:16 EST
Article-I.D.: burl.971
Posted: Fri Jan 24 12:14:16 1986
Date-Received: Sat, 25-Jan-86 04:01:36 EST

Distribution: net
Organization: AT&T Technologies, Burlington NC
Lines: 10

During a familiarization brief at the Atlanta Hamfest, the speaker told of an individual who using a TRS-80 Model 1 for packet communications. I am aware of the limitations of such a setup, but am curious if anyone has developed the software for an IBM-PC compatable to work packet without a separate TNC? I would just like to do it to get my feet wet in packet. If anyone knows of any available software please let me know.

Allen R. Shuff AI4G
(919) 228-4318

From 4820331573977696954
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9e63e5dca5f46758,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-25 20:37:03 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!genrad!mit-eddie!clements@bbnccq
From: clements@bbnccq
Newsgroups: net.ham-radio.packet
Subject: FCC & Automatic control (long but important)
Message-ID: <1046@mit-eddie.UUCP>
Date: Sat, 25-Jan-86 23:37:03 EST
Article-I.D.: mit-eddi.1046
Posted: Sat Jan 25 23:37:03 1986
Date-Received: Sun, 26-Jan-86 20:29:27 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 257

From: Bob Clements <clements@bbnccq.ARPA>

Before the PR
Federal Communications Commission FCC 86-18
Washington DC 20554 36413

In the Matter of)
)
Amendment of Part 97 of the) PR Docket No. 85-105
Commission's Rules to permit)
automatic control of amateur) RM-4879
radio stations.)

REPORT AND ORDER

Adopted: January 13, 1986; Released: January 16, 1986

By the Commission:

1. On April 5, 1985, the Commission adopted a Notice of Proposed Rule Making (50 F.R. 15196; April 17, 1985) to permit any amateur station to be under automatic control provided that operation was on frequencies above 29.5 MHz and that no third-party traffic was transmitted. This was an expansion of the proposal requested by The American Radio Relay League, Inc. (ARRL), who had requested automatic control only for stations transmitting digital communications while operating on frequencies above 30 MHz. Nineteen comments and one reply comment were filed in this proceeding. (1)

2. Our Notice of Proposed Rule Making in this proceeding, _supra_, particularly invited amateur radio operators experienced in automatic control to submit comments on the practicality of expanding automatic control to encompass all amateur operations, not just digital communications. Such comments were not forthcoming. Because of the lack of user support, we will adopt only the ARRL's recommendation to limit automatic control to digital communications on very high frequencies (VHF) and above. (We select 50 MHz rather than 30 MHz, as the petitioner requests, because there are no amateur frequencies between 29.7 and 50 MHz).

---

(1) Comments filed by the American Radio Relay League, Inc., (ARRL), Robert C. Clements, Jess de la Cuesta and Joseph Anthony Wolos were filed late. Consideration of the viewpoints expressed in those comments will aid in the resolution of this proceeding. Therefore, we accept them.

---

3. In the Notice, _supra_, we reminded amateur operators that the current rules require the presence of the control operator at the station control point whenever third-party traffic is being transmitted. We emphasized that the proposed amendments would still prohibit automatic control of the station when it is transmitting third-party traffic. Some commenters were confused about unsupervised third-party traffic. For example, repeater stations are already permitted to be operated under automatic control. However, as with any amateur station, when they are transmitting third-party traffic, the control operator must be present at the control point monitoring and supervising the transmissions.

4. Many of the commenters request that high-speed digital operating modes, such as packet-switching, bulletin boards, computer based message systems and electronic mailboxes be exempt from the requirement that the control operator supervise third-party traffic. They believe that the third-party rules as applied to such high-speed digital communications are impracticable and would, in effect, nullify the advantages of automatic control. To acquiesce in that request would be inconsistent with other

types of amateur operation. Third-party traffic is radio communications on behalf of anyone other than the control operator.(2) Neither the speed at which the message is transmitted nor the emission mode (voice, telegraphy, digital etc.) changes its character. This was pointed out in our letter of October 19, 1978, to Richard L. Baldwin, then General Manager of the ARRL.(3) In that letter, we reiterated that unsupervised third-party traffic by amateur stations is not permitted.

5. Some comments suggest that the third-party traffic rules be amended so that they would be applicable only at the time the third-party traffic is first introduced into the amateur communications system. However, screening the message content at its introduction does not change the character of the traffic. It is still third-party traffic which must be closely regulated in the non-common carrier Amateur service. Otherwise, amateur facilities and frequencies would be open to non-amateurs and could eclipse other amateur uses. Moreover, we are also concerned about the final destination of the message. We do not want to give our approbation to a mechanism which could be used to circumvent the international Radio Regulations which forbid exchange of amateur third-party traffic between countries who are not parties to agreements permitting such traffic.

---

(2) Section 97.3(v).
(3) FCC 78-742; 70 F.C.C. 2d 1303. See also News Release No. 2028, October 25, 1978.

International third-party radio communications are prohibited by Section 97.114 of the amateur rules and Article 32, number 2733 of the International Radio Regulations (Geneva, 1979), except where arrangements have been made between the two countries involved, Article 32, number 2734.

6. Some commenters suggest that MF and HF frequencies between 1.8 and 29.5 MHz be added to the frequencies available for automatic control or that automatic control be extended at least to all digital communications below 29.5 MHz on a regular basis or by temporary special authority (STA). They state that coast-to-coast coverage for point-to-point message handling would be accommodated by including MF and HF frequencies. Because of the possibility of congestion on the MF and HF frequencies, we do not believe that it would be advisable to permit automatic control on those frequencies.

7. Robert C. Clements is under the impression that we inserted a clarification into the proposed Section 97.79 (b) that the station licensee is presumed to be the control operator of the station, unless there is documentation to the contrary. However, this is essentially the same as the present wording of Section 97.79(b). The words "at all times" will be deleted from this rule in order to be consistent with the revised wording of Section 97.3(m)(3).

8. For the reasons given herein, we amend our rules to permit automatic control only for digital communications on amateur frequencies 50 MHz and above. Further, we affirm our present rule that requires the control operator to be present at the control point whenever the station is engaging in third-party traffic.

9. IT IS ORDERED, That Part 97 is amended as set forth in the Appendix hereto. This action is taken pursuant to the authority contained in Sections 4 (i) and 303 (r) of the Communications Act of 1934, as amended.

10. IT IS FURTHER ORDERED, That these rule amendments shall become effective, March 14, 1986.

11. IT IS FURTHER ORDERED, That the Secretary shall cause a copy of this Report and Order to be published in the Federal Register.

12. IT IS FURTHER ORDERED, That this proceeding is terminated.

---

13. Information in this matter may be obtained by contacting Maurice J. DePont, (202) 632-4964. Private Radio Bureau, Federal Communications Commission, Washington, D.C. 20554.

FEDERAL COMMUNICATIONS COMMISSION

William J. Tricarico
Secretary

Attachment: Appendix

APPENDIX

Part 97 of Chapter 1 of Title 47 of the Code of Federal Regulations is amended, as follows:

1. The authority citation for Part 97 continues to read as follows:

Authority citation: 48 Stat. 1066, 1082, as amended;
47 U.S.C. 154, 303.

2. Section 97.3 (m) (3) is amended to read:

Sec 97.3 Definitions.

* * * *

(m) * * *

(1) * * *

(2) * * *

(3) _Automatic control_ means the use of devices and procedures for control without the control operator being present at the control point when the station is transmitting.

3. Section 97.79 (b) is amended to read:

Sec 97.79 Control operator requirements.

* * * *

(b) Every amateur radio station, when transmitting, must have a control operator. The control operator must be present at the control point of the station, except when the station is transmitting under automatic control. The control operator must be a licensed amateur radio operator or permittee designated by the station licensee. The control operator and the station licensee are both responsible for the proper operation of the station. For purposes of enforcement of the rules of this part, the FCC will presume that the station licensee is the control operator of the station, unless documentation to the contrary exists.

---

4. Section 97.69 is amended by adding a new paragraph (d), as follows:

Sec. 97.69 Digital communications.

* * * *

(d) An amateur station may be under automatic control when transmitting digital communications on frequencies 50 MHz and above.

5. A new section 97.80 is added, as follows:

Sec. 97.80 Operation under automatic control.

(a) When under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules when the control operator is not present at the control point of the amateur station.

(b) No amateur station may be operated under automatic control while transmitting third-party traffic.

(c) Automatic control of an amateur station must cease upon notification by the Engineer-in-Charge of a Commission field office that the station is transmitting improperly or causing harmful interference to other stations. Automatic operation must not be resumed without prior approval of the Engineer-in-Charge.

6. Section 97.114 is amended by adding a new subparagraph (4) to paragraph (b) as follows:

Sec. 97.114 Third-party traffic.

* * * *

(b) * * *

(4) Third-party traffic from an amateur station under automatic control.

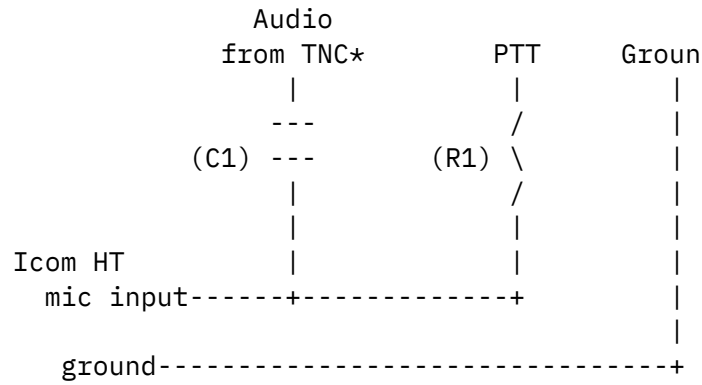
* * * *

[The above copy retyped for distribution by Bob Clements, K1BC, from the FCC text as obtained from ARRL. 25 January 1986.]

From 246916693130296345
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5d8c0daea2d4c883,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,5d8c0daea2d4c883,start
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1986-01-26 11:08:20 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxt!houxm!whuxl!whuxlm!akgua!akguc!
mtunh!ky2d-2!ka2ugq
From: ka2ugq@ky2d-2.UUCP (Tom)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: Correction to Icom HT to TNC schematic
Message-ID: <118@ky2d-2.UUCP>
Date: Sun, 26-Jan-86 14:08:20 EST
Article-I.D.: ky2d-2.118
Posted: Sun Jan 26 14:08:20 1986
Date-Received: Tue, 28-Jan-86 06:29:55 EST
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 31

Xref: watmath net.ham-radio:3790 net.ham-radio.packet:215

I made a big mistake in the previously-posted schematic of
the connection between an Icom IC-2A, 2AT, or 02AT and a
packet radio TNC, RTTY afsk unit, or another microphone.
The resistor and capacitor were backwards. The correct
schematic follows:



C1 - 0.47 uf capacitor
R1 - 25K resistor

* TNC or RTTY afsk or another microphone or whatever you are
  interfacing to your Icom HT.

-Tom KA2UGQ

  uucp: ..!ihnp4!bellcore!mtunh!ky2d-2!ka2ugq
    or: ..!ihnp4!bellcore!ka9q!tom
packet: KA2UGQ @ WA2SNA-1
  bomb: 40 41 N, 74 25 W
 2m FM: 145.750 MHz (local simplex)

From -8730795387118345659
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f2407062444432ef
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-28 13:38:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: Notesfiles $Revision: 1.7.0.10 $; site uiucuxc
Path: utzoo!watmath!clyde!cbosgd!ihnp4!inuxc!pur-ee!uiucdcs!uiucuxc!austen
From: austen@uiucuxc.CSO.UIUC.EDU
Newsgroups: net.ham-radio.packet
Subject: Re: Packet xfer
Message-ID: <147000001@uiucuxc>
Date: Tue, 28-Jan-86 16:38:00 EST
Article-I.D.: uiucuxc.147000001
Posted: Tue Jan 28 16:38:00 1986
Date-Received: Thu, 30-Jan-86 05:38:21 EST
References: <9262@ritcv.UUCP>
Lines: 15

Nf-ID: #R:ritcv.UUCP:9262:uiucuxc:147000001:000:565
Nf-From: uiucuxc.CSO.UIUC.EDU!austen Jan 28 15:38:00 1986

> Is there anyone out there who has any good ideas on transfering
>.com files via packet on two IBM PC's? We have tried xmodem, but the
>delays seem to always abort the xfer. It there any protocal that does
>not care about time delays?
> Cliff Skolnick
>
>{allergra, Seismo}!rochester!ritcv!cxs6277

If both TNCs are set up for 8 bit data and run in transparent mode you should
be able to transfer binary data. Another method is to create a .HEX file
and send that; I have used this method to send CP/M binary files over packet.

Jeff, K9JA.
austen@uiucuxc

From -9167913096412813052
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e67646049f7c0f5a,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-01-31 13:46:12 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!genrad!panda!talcott!
harvard!think!mit-eddie!USERBH0N%CLVM.BITNET@WISCVM.WISC.EDU
From: USERBH0N%CLVM.BITNET@WISCVM.WISC.EDU
Newsgroups: net.ham-radio.packet
Subject: Bare necessities
Message-ID: <12@mit-eddie.UUCP>
Date: Fri, 31-Jan-86 16:46:12 EST
Article-I.D.: mit-eddi.12
Posted: Fri Jan 31 16:46:12 1986
Date-Received: Sun, 2-Feb-86 01:09:03 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 15

From: Bill Kaster <USERBH0N%CLVM.BITNET@WISCVM.WISC.EDU>
I'm a novice and upgrading soon. However, when it comes to packet
radio I'm really a novice. I'm tracking down some literature on the
subject, but would like some help from the net in the meantime.
Basically:

          What is needed to use packet radio?

Feel free to expand upwards from the bare necessities. Note: I'll be
using a Zenith Z-100.

                                  Thank you in advance,

Bill Kaster, KA2WCS,
USERBH0N@CLVM, clutx!bh0n

From 1608538600236825042
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,fbf5a2f68e5f3976,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-02-03 11:26:18 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!genrad!mit-eddie!Morton
From: Morton@mit-eddie.UUCP
Newsgroups: net.ham-radio.packet
Subject: What do ya need
Message-ID: <45@mit-eddie.UUCP>
Date: Mon, 3-Feb-86 14:26:18 EST
Article-I.D.: mit-eddi.45
Posted: Mon Feb 3 14:26:18 1986
Date-Received: Wed, 5-Feb-86 01:26:20 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 43

From: "Morton Jim"@LLL-MFE.ARPA

In response to the request for info on what is needed to operate packet,

Three things are needed. First a terminal of some type, second a node controller and finally a radio. The terminal can be anything from a model 33 teletype to a computer running terminal emulation software.

The node controller is the heart of packet radio. It's function is to convert the digital ASCII data from your terminal into audio tones that can be transmitted and to decode the audio tones that you recieve into digital data for your terminal. The TNC also adds routing information and error checking data to your message. These additions are what makes a TNC different from a computer modem or RTTY TU. The information that is added conforms to a set of "rules" or standards that is called a protocall.

There are lots of different types of node controllers. Some you can buy ready to plug in and operate and some you build from kit. There are even programs for some computers that will turn them into a node controller (with the addition of a little hardware) while allowing the computer to act as the terminal for the system.

As for the radio, most packet activity is on 2 meters. just about any 2 meter radio will work. The popular frequencies include 145.01 145.03 145.05 145.07 and 145.09 although there are different frequencies in use in some areas. There is also packet on HF and it is usually AFSK SSB. this means that you just plug your tnc into

your SSB radio and you can operate hf packet. (this requires
tuning of the modem in the TNC in most cases).

If you want to learn more about packet, you can probably ask around
on the voice repeaters in your area and find someone who can help you.
If not, jump in with both feet and you might be the " first on the
block ". If you hear bursts of audio tones on the 2 meter frequencies
listed above, you are probably within range of other packet stations.
By monitoring those frequencies with your packet equipment, you would
be able to see the callsigns of other packet enthusiasts in your area.

Jim Morton WA6FWW via W6BXN

"Morton Jim" @ LLL-MFE (arpa)

From -1331908745739697186
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e67646049f7c0f5a
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-02-06 07:41:29 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site usl.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!houxm!whuxl!whuxlm!akgua!
akgub!usl!mahler
From: mahler@usl.UUCP (Steve Mahler)
Newsgroups: net.ham-radio.packet
Subject: WA8DED
Message-ID: <679@usl.UUCP>
Date: Thu, 6-Feb-86 10:41:29 EST
Article-I.D.: usl.679
Posted: Thu Feb 6 10:41:29 1986
Date-Received: Sun, 9-Feb-86 07:07:57 EST
References: <12@mit-eddie.UUCP>
Reply-To: mahler@usl.UUCP (Steve Mahler)
Organization: USL, Lafayette, LA
Lines: 8
Summary:

Would a user of the WA8DED software mail me the patch to
to allow "non-callsign" addresses ... tnxs ...

(if its different for different releases of the software, please
ident your patch version.)

Steve N9DRR

From 7660219702761303796
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9f79997cdbc47582,start
X-Google-Attributes: gid11bd51,public

X-Google-Thread: 151e61,9f79997cdbc47582,start
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1986-02-09 11:32:20 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!decwrl!amdcad!lll-crg!
seismo!mo
From: mo@seismo.CSS.GOV (Mike O'Dell)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: FCC awards pink ticket for BBS
Message-ID: <1346@seismo.CSS.GOV>
Date: Sun, 9-Feb-86 14:32:20 EST
Article-I.D.: seismo.1346
Posted: Sun Feb 9 14:32:20 1986
Date-Received: Tue, 11-Feb-86 07:20:08 EST
Organization: Center for Seismic Studies, Arlington, VA
Lines: 22
Keywords: BBS Pink
Xref: watmath net.ham-radio:3818 net.ham-radio.packet:222

I have just been informed that all the packet BBS's are now off the air.
A ham in Florida was just awarded a pink ticket for operating a packet
BBS. I don't have many (any!) details, but the cause cited appears
to be the bit about "no 3rd party traffic while under automatic control."
(See the latest ARRL newletter for details....)

While I am not a fan of interconnecting BBS's (we know how well Usenet
works - I hope ham packet is more useful!), this materially restricts
why anyone would want to use packet in the first place - computer to
computer communications (yes, a TNC is a computer...).

Rumor has it that the august ARRL considers packet to vitally important
to the survival of ham radio. I suggest they mount an effort at least
as vocal as the last "no code" fiasco if they don't want to see it go
down in flames. The next thing you know, they'll be applying the ruling
to digipeaters.

    "I learned the code, so now what can I connect to??"

    -Mike O'Dell
    KB4RGM

From -6877391465279855538
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9f79997cdbc47582
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,9f79997cdbc47582
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1986-02-11 14:14:29 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.3 Unisoft-Cosmos; site kepler.UUCP
Path: utzoo!linus!decvax!decwrl!pyramid!hplabs!well!micropro!kepler!mojo

From: mojo@kepler.UUCP (Morris Jones)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: Re: FCC awards pink ticket for BBS
Message-ID: <501@kepler.UUCP>
Date: Tue, 11-Feb-86 17:14:29 EST
Article-I.D.: kepler.501
Posted: Tue Feb 11 17:14:29 1986
Date-Received: Thu, 13-Feb-86 19:05:49 EST
References: <1346@seismo.CSS.GOV>
Reply-To: mojo@kepler.UUCP (Morris Jones)
Organization: MicroPro Int'l Corp., San Rafael, CA
Lines: 29
Xref: linus net.ham-radio:3222 net.ham-radio.packet:230
Summary: The FCC has a point. Suggestions?

There's a very important point to the FCC ruling that we have to
remember. Amateur Radio CANNOT become a common carrier! Besides
providing unfair competition with the commercial carriers, it's
contrary to the spirit of *Amateur* Radio as experimentalists and
hobbyists.

Now how do we tread the fine line and operate our packet BBSes? If
there really is no control over third party traffic on Amateur Radio,
then we start to cross that line. I think at the very least we'll
have to emphasize clearly the nature of the third party traffic that
will be permissable (non-business, trivial, experimental -- following
the guideline that "Amateur Radio traffic must be trivial to the
degree that recourse to the established commercial carriers is not
justified").

I also think we're going to have to provide more control over the
BBSes -- more control operators and control points. It may mean
a set of rules for designating BBS users as control operators, and
providing protected access.

It won't be easy, but we can find a way to live with it.

Personally I think the spectrum should be chopped up and sold to
the highest bidder ....

--
Mojo
... Morris Jones, MicroPro Product Development
{lll-crg,ptsfa,dual,well,pyramid}!micropro!kepler!mojo

From -3627387215954704106
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6149095fc99c7cb6,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-02-12 04:12:23 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP

Path: utzoo!linus!decvax!genrad!mit-eddie!hoffman%pitt@CSNET-RELAY.ARPA
From: hoffman%pitt@CSNET-RELAY.ARPA
Newsgroups: net.ham-radio.packet
Subject: Report from TAPR annual meeting (long)
Message-ID: <147@mit-eddie.UUCP>
Date: Wed, 12-Feb-86 07:12:23 EST
Article-I.D.: mit-eddi.147
Posted: Wed Feb 12 07:12:23 1986
Date-Received: Fri, 14-Feb-86 06:04:36 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 272

From: Bob Hoffman <hoffman%pitt@csnet-relay.arpa>
The following messages are from CompuServe's HamNet. Thanks are due to
Scott Loftesness, W3VS, for traveling to Tucson and filing this report.

#: 37701 S9/Packet/RTTY/AMTOR
    09-Feb-86 01:10:36
Sb: Annual Mtg. Agenda
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

Here's the agenda of today's TAPR Annual Meeting:

Welcome - Lyle WA7GXD
Presentation - Andy N0CCZ
LSC-10 & Clone - Pete WB9FLW
JAS-1 - Tac JA2PKI
SAREX2 - Tom W3IWI
OSCAR 11 - Harold NK6K
Braille - Ron AG7H
PACGRAM - Jay WB8TKL
ARRL - Fried WA6WZO
Lunch
Dual Port - Tom KC6OX
TNC2 - Mike WB6HHV
9600 bps radio - Steve K9NG
TAPR NNC - Lyle WA7GXD
AEA PM-1 - Al N6RFK
HF Tuning & Kaypro 10 - Dan KE7CZ
Regional Reports - Bill WD0ETZ, Tom W3IWI, Gwyn W1BEL

Additional news from several of these topics follow in later messages!

#: 37702 S9/Packet/RTTY/AMTOR
    09-Feb-86 01:11:02
Sb: #TAPR Directors
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

TAPR Board of Directors election results were announced at today's annual meeting. The following individuals were elected:

Steve Goode, K9NG
Eric Gustafson, N7CL
Lyle Johnson, WA7GXD
Scott Loftesness, W3VS
Gwyn Reedy, W1BEL

#: 37703 S9/Packet/RTTY/AMTOR
09-Feb-86 01:11:45
Sb: WB9FLW Gets Award!
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

At today's Tucson Amateur Packet Radio group annual meeting, Pete Eaton, WB9FLW, received a special award. A special presentation model ALJ-1000 was presented to Pete by Andy Freeborn, N0CCZ, one of the original designers of the ALJ-1000. According to Andy, the ALJ-1000 that Pete received was the last production model produced - and was presented to Pete in recognition of Pete's outstanding coordination of the TNC-2 and ALJ-1000 programs.

#: 37704 S9/Packet/RTTY/AMTOR
09-Feb-86 01:13:25
Sb: JAS-1 Update
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

At today's TAPR annual meeting, Tak, JA2PKI provided an update on the significant progress that's been made on JAS-1, a Japanese amateur satellite scheduled for launch in August of this year

JAS-1 is a joint project of the JARL and JAMSAT. It will provide both analog and digital packet radio transponders. The packet radio transponder will function as a bulletin board system. It uses a Z-80 based (NSC800 CMOS) computer with 1.5 mb of RAM memory (1 mb of which is usable due to error detection/correction).

The satellite will contain one receiver (2m), 2 transmitters (70 cm - one digital, one analog) and weigh a total of 110 lbs. It's is small in size (16"x16"x18.5") and there is a total of 8.5 watts power available onboard the spacecraft. The satellite will ride the Japanese H-1 launcher (2-stage).

Both of the digital links runs at 1200 bps. The digital uplink channels will be 145.85, .87, .89, and .91 MHz. A ground station with 100w eirp will be required to work the satellite. The digital downlink (a single channel) will be on 435.91 MHz. The ground station receiving system design point is 15 dbi. The uplink station will need to use a Manchester encoding scheme to transmit to the satellite. The downlink from the satellite will use PSK modulation. TAPR and JAMSAT are discussing the possibility of TAPR providing a modem to accomplish this as a TAPR kit project.

Of the 1 mb of usable system memory, some 32 kb will be used for the operating system. The remainder of the memory will be available for message storage.

The analog transponder will use 145.9-146 MHz as the uplink channel and 435.9 -435.8 MHz for the downlink. A beacon will operate on 435.795 MHz.

JAS-1 will be launched into an orbit similar to shuttle orbit - approx 50 deg inclination. It should pass over the same place on earth some six times/day and be visibilt for about 20 minutes on a pass.

#: 37705 S9/Packet/RTTY/AMTOR
09-Feb-86 01:14:04
Sb: SAREX2 Update
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

Tom Clark, W3IWI, provided an update on the SAREX2 experiment which had been planned for a March '86 shuttle flight. With the tragedy a week ago, it isn't know when, or if, this experiment will fly. SAREX2 is a packet radio experiment which planned to use 144.95 MHz for uplink and 145.55 MHz as the downlink - an intentional 600 khz split. Using a TRS-80 Model 100, specially programmed TAPR TNC-2, and the Motorola HT SAREX2's objective is to work as many packet radio stations as possible during the shuttle mission.

Tom advised that the Doppler effect ill be very important to successfully working SAREX2. He also advised that many packet radio users will need to reduce the deviation on their FM radios to compensate for off frequency operation resulting from Doppler effect.

#: 37706 S9/Packet/RTTY/AMTOR
09-Feb-86 01:14:39
Sb: TNC-1 4.0 Code
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

Packet users running TAPR TNC-1's (or the AEA or Heathkit clones) have been anxiously awaiting release 4.0 of the programming for the TNC-1. Harold Price, NK6K, provided an update on the status of this project. Unfortunately, it has taken Harold much longer to finish this code than had been anticipate. The major problem is the 6809 microprocessorused in the TNC-1. This is a difficult micro to port Pascal code to - and Harold's been fighting compiler bugs, 90 minute compilation times, and other frustrations trying to finish this code. All he could say is that he found a significant compiler bug just before coming to Tucson - and, with a little bit of luck, that will be the infamous last bug!

#: 37707 S9/Packet/RTTY/AMTOR
09-Feb-86 01:15:10
Sb: UO-11/DCE Update

Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

Harold Price, NK6K, reported on the progress that's been made with the data communications experiment (DCE) flying on the UoSAT/OSCAR-11 amateur radio satellite. New programming uploaded to UO-11 provides a 96k message storage area, room for 128 messages, and a 16k max message size. It has been determined that on a signle UO-11 pass, about 40k of data can be transferred via this new software/satellite combination. Access today will only be via Gateways stations. NK6K, UoS, Vita, WD0ETZ, VK/ZL/JA stations will be likely gateways initially. Anyone can hear UoSAT 11 by listening to its 145.825 MHz output frequency.

#: 37708 S9/Packet/RTTY/AMTOR
    09-Feb-86 01:15:58
Sb: ARRL Update
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

Fried Heyn, WA6WZO, ARRL Southwestern Division Director, provided an update on the ARRL's concern on the recent FCC automatic operation ruling (PR-80-105). The League board of directors has authorized president Larry Price to take steps necessary to correct the restrictive effect of the FCC Report and Order.

He reported that the FCC has rejected PRB-2 (the request by an Arizona broadcaster to use ham radio for broadcast purposes).

He mentioned the 1986 ARRL National Convention which will be held in San Diego. One interesting ploy: anyone under 18 will be let in free - hopefully to stimulate interest in ham radio by youngsters/teens.

#: 37709 S9/Packet/RTTY/AMTOR
    09-Feb-86 01:16:15
Sb: Braille Packet
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

AG7H (Ron) & Jeff (N7FDS) reported on connecting a TNC to a Versabraille system. This unit converts RS-232 signals into Braille using a small keyboard based device. It uses pins to generate braille characters. Jeff will be writing software for this machine to better interface to packet.

#: 37715 S9/Packet/RTTY/AMTOR
    09-Feb-86 09:27:43
Sb: Packet Traffic
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

Jay Nugent, WB8TKL, from Ann Arbor, MI spoke on his Pacgram protocol. This protocol converts a standard ARRL Radiogram to a packet format with minimal characters. He will be presenting a paper at the upcoming 5th ARRL Computer Networking Conference. Additional information is available on his BBS: 313-971 -4529.

#: 37716 S9/Packet/RTTY/AMTOR
09-Feb-86 09:28:13
Sb: Dual Port TNC2
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

Mike Brock, WB6HHV, and Tom, KA6SOX, reported on their work to enhance a TNC-2 to provide dual port digipeater functions. What they've done is add additional logic outboard of the TNC-2 on RS232C side. Included is an interface to a state machine (on a PAL) and another modem to the second radio. Modifications to the TNC-2 are also required to bring out some signals required by the outboard logic. They have a PC board layout available for the state machine. They have also begun a project using modified Radio Shack "TALKMAN" radios on six meters - which they believe will offer some advantages over 220.

#: 37717 S9/Packet/RTTY/AMTOR
09-Feb-86 09:29:19
Sb: 9600 Baud Radios
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

Steve Goode, K9NG, provided an update on his 9600 baud modem project. According to Steve, only four groups are seriously working with the modem: KA6SOX (CA), K4GFG (FL), WB9MJN (IL), KE3Z (East Coast). These groups have reports several serious problems in attempting to get 9600 baud modems on the air: poor stability of the Hamtronics FM5 transmitter; poor image rejection of FM5 receiver; too narrow IF bandwidth on Midland 220 radios; and poor frequency stability of all radios.

Steve then described what he believes is required in terms of a radio to run at 9600 bps and, eventually, at 56 kbps. His list of features included: 220 MHz radio, stable transmitter with good specs, receiver with good specs, capable of 9600 bps with upgrade to 56 kbps later, fast turn around from T/R to R/T, synthesized, about 10 watts output.

Based on this list of requirements, Steve asked for feedback from the group on whether he was on the right track. Some discussion on just what problem was he trying to solve ensued. Most of the group was concerned with solving the backbone, high speed link problem - not attempting to develop a 9600 baud radio which could be sold to almost every packeteer. However, Steve got a general consensus to proceed with a design against those requirements. He has a basic design laid out - and is hoping to be able to get a unit put together this year sometime.

#: 37718 S9/Packet/RTTY/AMTOR
    09-Feb-86 09:29:53
Sb: AEA PM-1
Fm: HamNet*SYSOP Scott W3VS 76703,407
To: =TAPR NEWS=

AEA has announced a new packet modem, the PM-1. Intended for use as an HF Modem, it is installed between TNC and your TX/RX. It includes additional filtering to enhance reception and improves the signal to noise ratio for packet reception by some 10-15 db. It includes support for both 200 and 600 hz shift. The 600 hz secondary shift really is there for experimentation. Some believe there may be an advantage to the wider 600 hz shift on HF - especially on 20 meters with selective fading, etc. Also included in the unit is a builtin tuning indiciator to assist in getting on the proper frequency. Price range for the PM-1 is $170-180 with availability expected later this month.

--
73,
Bob Hoffman, N3CVL   {allegra, bellcore, cadre, idis, psuvax1}!pitt!hoffman
Pitt Computer Science   hoffman%pitt@csnet-relay

From 4765400081000007790
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,def1f46b2ea416,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-02-12 09:00:09 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.3 4.3bsd-beta 6/6/85; site decwrl.DEC.COM
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!decwrl!dec-rhea!dec-vmsint!
los
From: los@vmsint.DEC (Edward J. Los)
Newsgroups: net.ham-radio.packet
Subject: Need information on a Singer Model 883P modem
Message-ID: <1090@decwrl.DEC.COM>
Date: Wed, 12-Feb-86 12:00:09 EST
Article-I.D.: decwrl.1090
Posted: Wed Feb 12 12:00:09 1986
Date-Received: Fri, 14-Feb-86 02:57:09 EST
Sender: daemon@decwrl.DEC.COM
Organization: Digital Equipment Corporation
Lines: 4

Does anyone have information on the Singer Model 883P 1200/2400 BPS modem? Can it be jumpered for 202 operation on 2m?

Ed, KB1JG

From 1294913772821088897
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,8e9c24d71a4e8847,start
X-Google-Attributes: gid11bd51,public

X-Google-ArrivalTime: 1986-02-17 05:49:35 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site inuxd.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!inuxc!inuxd!rcf
From: rcf@inuxd.UUCP (R Fitch)
Newsgroups: net.ham-radio.packet
Subject: MFJ-TNC2 CLONE?
Message-ID: <847@inuxd.UUCP>
Date: Mon, 17-Feb-86 08:49:35 EST
Article-I.D.: inuxd.847
Posted: Mon Feb 17 08:49:35 1986
Date-Received: Tue, 18-Feb-86 03:55:28 EST
Distribution: net
Organization: AT&T Consumer Products, Indianapolis
Lines: 8

Does anyone have any information about the MFJ TNC2 Clone??
They are advertising it in QST for a low price and several
interested parties have asked me if it is truly compatible
and "really" a clone.

Any review or comments will be greatly appreciated.

Rich KN9K

From 2301297690208781090
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,3e5b2c9d866b5f13,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-02-19 20:32:04 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!clements@bbnccq.arpa
From: clements@bbnccq.arpa
Newsgroups: net.ham-radio.packet
Subject: more on FCC rules DE K1OJH
Message-ID: <237@mit-eddie.UUCP>
Date: Wed, 19-Feb-86 23:32:04 EST
Article-I.D.: mit-eddi.237
Posted: Wed Feb 19 23:32:04 1986
Date-Received: Sun, 23-Feb-86 05:42:22 EST
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 115

From: Bob Clements <clements@bbnccq.ARPA>
9953 PY 5749 K1BC   K1OJH   860220 more on FCC rules
At K1OJH :   197 From K1OJH Rcvd 860219/0200, Sent 860219/1931
Date: Feb. 18, 1986
  To: NEPRA SYSOPs
From: Dick Eastman
Subj: New FCC Regs

Just a note to let you know what I've been up to. In addition to the various bits and pieces of messages that I have been forwarding to you, I have also been talking with Perry Williams at the ARRL. Perry is the person at the League who deals primarily with the FCC. He did tell me a few things that have been going on recently.

First of all, the FCC monitoring station in Maine that has been getting all the publicity recently has not yet issued any citations. They have called (at least) two SYSOPs that they suspected might be running unattended H.F. stations. In one case, they found no licensed Amateur on the premises during time of operation. That person has not yet received a citation. If he does get one, it will be for unattended operation below 30 MHz. This issue is unrelated to the recent regulations issued. Unattended operation below 30 MHz always has been and will continue to be a violation of FCC regulations.

As to the new regulations, this is considered to be an "Open Issue", with several items not yet clearly defined by the FCC. The FCC's Chief of the Special Services Division (who is the Boss of the head of the Private Radio Branch which administers Amateur Radio) visited the ARRL in Newington last Thursday. He was given a demonstration of packet radio, including traffic handling via W1AW-4 running W0RLI software and W1AW-5 unattended digipeater. The Chief was favorably impressed by what he saw and discussed it at some length in a meeting afterwards. He stated that the FCC should be encouraging development of Amateur Radio digital networks.

ARRL President Price and several other reps, including Perry Williams will meet with the head of the FCC's Private Radio Bureau in Washington at the end of this month. At this meeting, the ARRL will suggest new definitions of Amateur communications in a "store and forward" mode versus Third Party Traffic. Both FCC Chiefs have verbally recognized there is a difference and have expressed willingness to consider them seperately. The League is very optimistic on this issue. The regulatory authorities in several European countries already differentiate handling messages on behalf of hams versus non-Amateurs. Hopefully similar logic can be worked into the FCC's regulations.

A second item on the agenda at this meeting will be a discussion of who holds responsibility for "traditional" Third Party Traffic. It is the League's position that the analogy is that of a postcard in the Postal System. It's free and open, anyone in the path may read it, but in most cases will not. The actual responsibility lies with the person who originated the message, not with each "mailman" along the route. The FCC may or may not agree with this analogy, the League has a bit less optimism on this.

There is a side issue here that I did not discuss with Perry:

> namely the rules about plain and unencrypted communications. I really have reservations about the recent developments in sending binary files back and forth. I'm not sure I know all the ramifications of this, but I sure am uneasy about someone loading a binary file onto a PBBS to be pulled later by someone else. In a direct QSO, there would be less of a question. I would sure hate to "muddy the waters" when discussing BBS freedoms with the FCC.

Depending upon the outcome of the ARRL/FCC meeting, the ARRL will file for Reconsideration of the recent rulemaking. Perry Williams also recommends other interested individuals and groups should also file for reconsideration. Calm, well-thought out comments in volume will help. (Unless I hear otherwise from NEPRA's officers, I will also file such a motion in the name of NEPRA.)

What do we do today? Perry very quickly pointed out that no one at the League will recommend that you do or do not continue operating your VHF BBS in unattended mode. He said that in his recent discussions with FCC officials, it is clear to him that the FCC has not finally decided how to handle ham radio "store and forward" QSOs. The recent written rulemaking was very definitive in some ways, yet does not reflect what the various FCC officials are saying in face-to-face conversations.

Perry Williams would not give an "official" League recommendation, but did point out that W1AW-4 and W1AW-5 are remaining in operation in unattended mode. In fact, this unattended VHF BBS was demonstrated to a senior FCC official last Thursday. Perry stated he would be "very surprised" if anyone receives a citation for unattended operation of a BBS above 30 MHz.

What does NEPRA recommend to New England SYSOPs? The conservative viewpoint is to operate only when the SYSOP is seated in front of the screen with his finger on the switch. A more liberal method is "damned the regulations, full speed ahead". I believe the reality is some where in between. The FCC is very interested in unattended operation on H.F., but has paid no attention to VHF operations. Obviously, each of you must decide for yourselves. Probably maintaining a low profile is best. I, for one, am very willing to have an unattended VHF BBS in operation under my call. If I had an H.F. gateway, I'd power the H.F. rig off whenever there wasn't a licensed amateur in the house.

For the future: I (we) should file a Request for Reconsideration with the FCC. Input is hereby solicited. Please pass on your concerns to the traffic handlers using your BBS. The National Traffic System should be heavily involved in this.

To quote that great American philosopher, Yogi Berra: the game ain't over 'till it's over.

- Dick, K1OJH

From 4989150493583758811
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9f79997cdbc47582
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,9f79997cdbc47582
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1986-02-20 15:58:11 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!rochester!ritcv!ccivax!rb
From: rb@ccivax.UUCP (rex ballard)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: Re: FCC awards pink ticket for BBS
Message-ID: <421@ccivax.UUCP>
Date: Thu, 20-Feb-86 18:58:11 EST
Article-I.D.: ccivax.421
Posted: Thu Feb 20 18:58:11 1986
Date-Received: Mon, 24-Feb-86 05:00:37 EST
References: <1346@seismo.CSS.GOV> <501@kepler.UUCP>
Reply-To: rb@ccivax.UUCP (What's in a name ?)
Organization: CCI Telephony Systems Group, Rochester NY
Lines: 24
Xref: linus net.ham-radio:3247 net.ham-radio.packet:240
Summary: The FCC is "selling the park"

As I recall, AT&T attempted to get the FCC to outlaw phone patches
on the basis that the established common carrier was loosing
the revenue from the long distance connection.

A citation such as this does not necessarily mean that the final
word has been given, but it is not a good sign. It seems like
the FCC has taken a profound change in it's role as protector of
a public commodity. The emphasis seems to be on commercialization
of the "Ether" (tells you how long I've been a ham).

I personally see this as being identical to selling national park
land.

Of course, when looking at the "Mobile Homes" in the national parks,
and the "Store Bought Ham Gear" in some ham shacks, I wonder if these
actions are not justified. The last "Home Brew" rig I built wouldn't
be usable today (no FCC certification). As for "advancing the state
of the art", except for a few "advancements" in the digital communications
fields, the last big contributions of ham radio were "SSB", and "SSTV".

I keep wondering how long it will be before "CB" bbs's start showing
up.

If we don't use it, we'll loose it.

From 4392353627509875296
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,fee62631134991b2,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-02-26 06:10:31 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site genat.UUCP
Path: utzoo!utcs!mnetor!genat!george
From: george@genat.UUCP (George Gorsline)
Newsgroups: net.ham-radio.packet
Subject: Gateway Vol 2, Number 11
Message-ID: <2575@genat.UUCP>
Date: Wed, 26-Feb-86 09:10:31 EST
Article-I.D.: genat.2575
Posted: Wed Feb 26 09:10:31 1986
Date-Received: Thu, 27-Feb-86 05:49:54 EST
Organization: Genamation Inc. (Toronto Ontario, Canada)
Lines: 414

Gateway: The ARRL Packet-Radio Newsletter
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Editor:
Ed Raso, WA2FTC

NORTHERN NEW JERSEY 220 MHz DIGIPEATER

The first full time 220 MHz digipeater in northern New Jersey is now operational, according to Harold Winard, KB2M.

The digipeater operating under the call of KB2M-7 is located in Mount Arlington, New Jersey, about 20 miles northwest of Morristown and slightly east of the Delaware River. At an elevation of 1230 feet above sea level, KB2M-7, can cover a substantial portion of northern and central New Jersey and adjacent portions of New York state and Pennsylvania.

The digipeater is presently operating on 221.01 MHz. However, there appears to be some local interference from television receivers and the frequency my change as need dictates.

Harold would like to hear from anyone who has experienced similar interference problems. He may be contacted at the following address:

Harold Winard, KB2M

30 West Union Turnpike
Apt. B-2
Wharton, NJ 07885-1702

From KB2M

OREGON TO SF BAY PACKET CONNECTION

On January 3, 1986, W6UJA located in the San Francisco Bay area, had a packet QSO with WB7SZM in Ashland, Oregon. The 500-mile connection was made via six 2 meter digipeaters, and was the first reported San Francisco Bay area to Oregon packet-radio contact on 2 meters. The path used was via W6AMT, W6AMT-7, WA6YNG-1, W6SOP, WA7KSW-1, WB7SZM-1. It is hoped that this path into Oregon will eventually be improved and made more reliable.

The San Francisco Bay area also has a path to northern Arizona and southern Nevada already in operational via W6AMT, W6AMT-1, W6AMT-2, W6AMT-3, AA6TN-1, WA7HXO-3. These paths are operating on 145.01 MHz, with a redundant system now being developed on 145.05 MHz to increase the reliability.

Via HAM/LINK

HF PACKET TUNING INDICATOR

If you operate HF packet, or are thinking of becoming an HF packeteer, you probably already know that tuning can be very critical. To ease this situation, TAPR is hard at work developing a P.C. board for an HF Tuning Indicator that will interface with the TNC 1 and TNC 2. It is reported that the indicator will allow you to tune to a resolution of 10 Hz.

Working from the circuit that appeared in the Packet Status Register issue number 17, Lyle Johnson, WA7GXD, has laid out a neat two sided circuit board. All active components are available from Radio Shack (3 ICs and 2 LED bar displays).

Prototype boards have just been completed in St. Louis and will be tested in Arizona before being offered for sale by TAPR. The price has not been announced.

Via HamNet

FIRST VK/US PACKET TRAFFIC PASSED

"On January 10, 1986, N6EEG and VK2BVS passed 3 pieces of standard ARRL formatted NTS traffic, marking the first third party packet-to-packet formal traffic. The messages were promptly forwarded from N6EEG to K6APW, where they were put directly into the Pacific Area Net.

"Through the hard work of West coast mailbox owners, VK2BVS and

W7GHT (Pacific Area Staff Chairman), it is hoped that there will soon be a reliable method of passing U.S./Australian third party traffic routed to the Pacific Area Net (NTS) via the packet-radio mailbox system.

"Packet radio offers many advantages such as 24-hour time flexibility that is relatively immune to changing band conditions and the disparity of common waking/working hours for schedules between the two diverse geographical areas.

"Experiments will continue, hopefully having VK2BVS able to check in direct to the West coast packet mailboxes and dump all the U.S. bound traffic. All West coast HF Gateways/Mailboxes have assigned NTS liaison stations. We also hope to establish a nationwide standard for NTS store and forward traffic designators, using the W0RLI
method. It is hoped that this will also solve the Hawaii and Alaska traffic problems.

"Congratulations to N6EEG and VK2BVS. May this herald in a fruitful year for NTS."

From NI6A

MFJ TNC 2 DELAY

Word has it that delivery of MFJ's new TNC 2 clone has been delayed by a month. This should put the the unit on the shelves sometime in March. The MFJ TNC 2 clone will contain an RS-232-C interface as well as a TTL interface for the C 64 and VIC 20, and will be housed in MFJ's own cabinet. The firmware will be compatible with the TAPR TNC 2 and will support multiple connects and AX.25L2V2. The selling price is reported to be $129.95.

Via WB9FLW

TAPR ANNUAL MEETING

"TAPR has located another hotel for those planning to attend the annual meeting on February 8th. The Roadway Inn, located just across from the All Star Inn, is within walking distance of the TAPR office and a 10 minute drive from the airport and site of the TAPR meeting. The rates at the Roadway Inn are $38.00 for a single and $48.00 for double occupancy. Reservations for the Roadway Inn can be made by calling (602) 884-5800.

"After the Friday night Packet Pizza Party, we will proceed to the Malibu Grand Prix Race Track on 22nd Street in Tucson. This is to continue a TAPR tradition that was started at the 1985 ARRL National Convention. Old timers Harold Price, NK6K, and Lyle Johnson, WA7GDX, will be happy to show newcomers the ropes. It's an experience that you will never forget."

Via WB9FLW

HELP NEEDED

The Little Astronauts Amateur Radio Club of Astoria, New York Intermediate School is interested in packet radio. They would also like to maintain a digipeater at their site.... it would operate on 145.03 MHz to help extend POLINET (Packet Of Long Island Network) into the NYC area and northward.

Wanted is 2 meter FM gear suitable for packet radio. Old crystal radios, including HTs are perfect! If anyone wants to throw in a TNC or computer...you'll have the love and appreciation of all science students at the school! All donations are tax deductible.

For more information, contact:

Little Astronauts Amateur Radio Club
c/o Ron Lulov, KD2LA
Astoria Intermediate School
31-51 21st Street
Long Island City, NY 11106
(718) 274-8316

From KD2LA

NNC PROTOTYPE TESTING UPDATE

We received this update on the Network Node Controller (NNC) from Lyle Johnson, WA7GXD.

"The NNC Prototype PC board has now been suitably hacked because of:

"a) incompatibility of HD64180 uP with Z80(tm) peripherals running Mode 2 interrupts

"b) requirement of parallel printers to get a pulsed signal telling when data is ready.

"I patched the Z-system BIOS to recognize the modified Z80 PIO B port as the system listing device. It is now fully Mode 2 interrupt driven and the OkiData uLine 93 printer loves it! The wait-state generator has been reworked to provide a single wait-state during op-code fetches in the lower 256 kbytes of address space as well as providing the required leading edge delay in the !LIR signal from the HD64180 to more closely emulate the !M1 signal from a standard Z80.

"The system clock is 4.608 MHz (9.216 MHz crystal) and the BIOS has been modified to accept this data rate. The disk drives have been interfaced and run just fine with the disk controller

running under DMA control. The SIOs have been tested using a simple test procedure sending HDLC frames and receiving them in a full duplex loopback system; interrupts have not yet been tested with the SIOs. The SCSI interface has been tested to the extent of verifying that the uP can in fact talk to the registers of the NCR5380 chip and read the registers from the chip.

"The modified schematics will be sent to St Louis this weekend to get the necessary changes CADded. We hope to have the revised artwork back in Tucson by Friday the 17th and test boards in time for the annual meeting. One additional change being implemented is replacing the op-amp RS-232-C driver with a CMOS RS-232-C driver for better operation at higher data rates.

"If the revised artwork is accurate, then we will immediately push the button on getting the Alpha and Beta PC boards fabricated."

From WA7GXD

W0RLI VERSION 11.1 RELEASED

Version 11.1 of the W0RLI Mailbox/Gateway software has been released. Hank Oredson, W0RLI, author of the well known PBBS has included several additions to his code. Changes include the following:

On the user side, when a station drops into the Gateway mode, he can monitor activity (in real time) on the other TNC. This may help cut down on channel congestion somewhat, as a user can now see if the station he wishes to call is already connected to someone else. Users entering the mailbox can now add their names to the user log instead of having it entered by the SYSOP. Hank has also added a very short menu for stations flagged as PBBSs.

On the operator side, the SYSOP can flag and display users marked as PBBSs, and allow only stations flagged as PBBSs to connect on either the COMM or PRINTER ports.

To obtain the most recent version of the W0RLI software, send an 8-inch disk with return postage (two disks for source code) to:

Wes Morris, K7PYK
7422 E. McKinley St.
Scottsdale, AZ 85257

From KE3Z

KANTRONICS V 2.0 FIRMWARE

Kantronics has announced the availability of version 2.0 firmware for the Kantronics Packet Communicator. New features are:

o AX25L2V2
o Multiple Connects

Price for the upgrade is $20.00 and will be available on
February 3rd.

     Via DRNET

IBM PC TERMINAL PROGRAM

If you are using an IBM PC or compatible to interface with your
TNC, then you may be happy to know that a terminal program for
the PC has been developed. Norm Wilcox, W2GRH, has written a
packet terminal program called QPACKET based on the popular PC-
TALK communications software. According to Norm, the software
acts very much like PC-TALK, and uses the same basic command
structure. Some of the features included in QPACKET are:

o PC-TALK like commands
o TNC initialization file
o Split-screen operation
o ASCII and Binary file transfer
o Auto-answer
o Remote file transfer

For more information, contact:

      Norm Wilcox, W2GRH
      RD #5 Box 82
      Kingston, NY 12401

     From W2GRH

HAPN ANNOUNCES IBM PC PACKET ADAPTER

The Hamilton Area Packet Network, (HAPN) a packet-radio club
dedicated to furthering the state of packet radio, has announced
the availability of the HAPN Packet Adapter Card for the IBM
PC/XT/AT.

The HAPN adapter is unique in terms of its versatility and ease
of operation. It is designed for the IBM PC and compatibles. The
IBM PC or compatible is rapidly becoming a leader in the amateur
community because of its attractive price and excellent
performance.

The HAPN packet adapter is a card that plugs directly into one of
the slots of the PC. It contains a built-in modem which
interfaces to the radio with a DB9 connector. The card is 8.5
inches (22 cm) long and contains a prototype area. The software
is powerful and is a delight to use. The transfer of ASCII or
binary files is very simple by using the function keys on the

keyboard. A popup menu allows you to set up the repeater routing table. Optional software is available for bulletin board operation. Experimental protocols such as VADCG V1 and V2 are also available.

Features of the H.A.P.N. packet adapter :

1. In addition to the AX.25 protocol it also runs the Canadian experimental protocols V1, V2 as designed by Doug Lockhart, VE7APU, of the VADCG (Vancouver Amateur Digital Communications group).

2. Software available at present:

   a. AX.25 host support (included)
   b. bulletin board program PCRBBS (optional)
   c. file transfer programs (optional)
   d. experimental protocol support for VADCG V1, V2 (optional)

3. The HAPN adapter plugs into a PC, PC-XT, PC-AT or compatible. No external cabinet or power supply is required.

4. Simple to interface to your radio. It requires RX audio, TX audio and push-to-talk. The carrier detect (radio channel busy) is generated internally from the received data or optionally brought out from your squelch circuit.

5. Built-in modem is Bell 202 compatible. It uses the XR2206 and XR2211 chipset. The tones are 1200 and 2200hz. The data rate is 1200 bit/s. A hardware watchdog circuit prevents possible TX runaway problems as a result of power glitches or lightning.

6. The board contains a pre-drilled prototype area for personal use.

7. The adapter is based on the INTEL 8273 HDLC/SDLC protocol controller chip with a straightforward interface to the PC.

8. The low level software (device driver) is interrupt driven and stays resident in the PC allowing the adapter to function in the background. An application program such as bulletin board, file transfer or terminal program does not have to be resident for the adapter to function. In this mode, the

user is alerted to a caller by a connect alarm utilizing the PC's speaker.

9. Easy customizing for the user. The user configuration such as callsign/SSID, auto logging of packet activity to disk, default repeater, connect alarm etc. are set up using the configuration screen and remembered by the program. These options can be changed at any time.

10. NOTE FOR PROGRAMMERS

    Since the adapter uses the native code of the host computer no cross compilers are needed for anyone wanting to develop his own code.

ORDERING INFORMATION AND PRICE :

All prices are in US$ and include postage and handling in USA or Canada. Please add 3$ for overseas orders.

1. Assembled and tested board with AX.25 host

   software and self-test program (4 programs and documentation) $199.00

2. Bare board with AX.25 software and construction details $75.00

3. AX.25 software $40.00

4. Bulletin board & file transfer programs $25.00

5. Advanced VADCG experimental software $ 25.00

Make checks and money orders payable to H.A.P.N.

The mailing address is :

HAPN
Box 4466, Station D,
Hamilton, Ontario,
Canada, L8V4S7

Via DRNET

REPRODUCTION OF GATEWAY MATERIAL

Material may be exerpted from Gateway without prior permission, provided that the original contributor is credited and Gateway is identified as the source.

... de VE3YDX - The Yonge St. DX Association {VE3 EZU FEA FIU IPR}
--
     George Gorsline, Jr. VE3FIU / K8HI
     One of the VE3YDX gang... Y DX? Because it's there(~Y)!
               __... ...__ . ... _.. _.._
     Genamation, 351 Steelcase Rd. West, Markham Ontario L3R 3W1
     {allegra|linus|ihnp4|...}!utzoo!mnetor!genat!george
     (416) 475-9434

From -2863933068531897559
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,b4e9f129a67530a2,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-03-07 21:45:27 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 (Tek) 9/28/84 based on 9/17/84; site leia.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!ittatc!dcdwest!sdcsvax!ncr-
sd!hp-sdd!hplabs!tektronix!orca!tekecs!leia!tomk
From: tomk@leia.UUCP (Tom Kloos)
Newsgroups: net.ham-radio.packet
Subject: Request for WA8DED version 1.1
Message-ID: <109@leia.UUCP>
Date: Sat, 8-Mar-86 00:45:27 EST
Article-I.D.: leia.109
Posted: Sat Mar 8 00:45:27 1986
Date-Received: Mon, 10-Mar-86 08:39:41 EST
Reply-To: tomk@leia.UUCP (Tom Kloos)
Organization: Tektronix, Wilsonville OR
Lines: 11
Keywords: wa8ded

I understand that the binary for version 1.1 of Ron's code package for
the TNC-1 and clones may be on Compuserve. Has anyone uploaded it to
a machine that can mail it to me via uucp along with the documentation?
I have 1.0 now, but would like 1.1 due to a cleanup of supervisory frame
handling.

Thanks in advance...
-Tom Kloos, WA7NJK, Tektronix, Wilsonville, Oregon
     Ignore paths in header. Use this:
uucp: ..{ucbvax,decvax,uw-beaver,hplabs,ihnp4,allegra}!tektronix!orca!tomk
ARPA: tekecs!tomk.tek@rand-relay

From 2813261215110207824
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9c4c55379620ff44,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-03-12 14:30:23 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!linus!philabs!cmcl2!

harvard!think!mit-eddie!GILLMANN
From: GILLMANN@USC-ISIB.ARPA
Newsgroups: net.ham-radio.packet
Subject: TAPR TNCs as wired LAN?
Message-ID: <1257@mit-eddie.MIT.EDU>
Date: Wed, 12-Mar-86 17:30:23 EST
Article-I.D.: mit-eddi.1257
Posted: Wed Mar 12 17:30:23 1986
Date-Received: Sat, 15-Mar-86 22:18:06 EST
Sender: jbs@mit-eddie.MIT.EDU
Organization: M.I.T. EE/CS Computer Facility, Cambridge MA
Lines: 8

From: Richard Gillmann <GILLMANN@USC-ISIB.ARPA>

Has anyone ever tried using TAPR/AX.25 TNCs to connect PCs in
a hard wired local area network? It occurs to me that this
ought to work at 56KBS and be really cheap, like $125/node.

Dick Gillmann

From -5472235304249840990
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9c4c55379620ff44
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-03-13 00:20:22 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!linus!philabs!cmcl2!
harvard!think!mit-eddie!F33PAP%DHHDESY3.BITNET
From: F33PAP%DHHDESY3.BITNET@WISCVM.WISC.EDU
Newsgroups: net.ham-radio.packet
Subject: Re: TAPR TNCs as wired LAN?
Message-ID: <1261@mit-eddie.MIT.EDU>
Date: Thu, 13-Mar-86 03:20:22 EST
Article-I.D.: mit-eddi.1261
Posted: Thu Mar 13 03:20:22 1986
Date-Received: Sat, 15-Mar-86 22:22:34 EST
Sender: jbs@mit-eddie.MIT.EDU
Organization: M.I.T. EE/CS Computer Facility, Cambridge MA
Lines: 11

From: F33PAP%DHHDESY3.BITNET@WISCVM.WISC.EDU

Hello!
I heared rumors that the CCC (Chaos Computer Club) here in Hamburg
wanted to wire their local network with AX.25 TNC's. I don't know
if they did it. TAPR TNC's were too expensive for them...
But: To use 56 kBd you would have to change something in the
TAPR-TNC hardware (for the TNC-1). Without a change in the
clock circuit the TNC-1 will only be able to work up to 4800 Bd, I
think (?).

Karl-Heinz DK8HI

From -3824525837360481979
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,38bc5bfd373c202,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-03-13 09:33:06 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.3 4.3bsd-beta 6/6/85; site decwrl.DEC.COM
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!decwrl!dec-rhea!dec-koning!
koning
From: koning@koning.DEC (Paul Koning -- LAS Engineering)
Newsgroups: net.ham-radio.packet
Subject: Re: Link layer thoughts
Message-ID: <1655@decwrl.DEC.COM>
Date: Thu, 13-Mar-86 12:33:06 EST
Article-I.D.: decwrl.1655
Posted: Thu Mar 13 12:33:06 1986
Date-Received: Sat, 15-Mar-86 01:46:51 EST
Sender: daemon@decwrl.DEC.COM
Organization: Digital Equipment Corporation
Lines: 111

On 23-Dec-1985, Phil Karn (KA9Q) posted a paper about ACK acknowledgement
as a way to improve performance on noisy channels.

After thinking about the details for a while, I feel that the analysis
is inaccurate and that there is in fact little benefit from the proposal;
it seems that the ALOHAnet people didn't think things through all the way.
Here's why:

The basic notion is that one should not retransmit Data messages if it
is not necessary to do so. The main reason is that data messages are
large and it is better to transmit small control messages instead.
There are two cases where the sender of a data message fails to receive
an ACK:

1. The data message was lost. In this case, the receiver never sent
   the ACK, and the optimal recovery is to resend the data.

2. The data message was received but the ACK was lost. In this case,
   the optimal recovery avoids resending the data.

It's pretty obvious (and Phil shows the details) that detecting the
second case as a special case is worthwhile IF you assume that the
two cases have equal probability. Phil also points out that they in
fact do not have equal probability but doesn't follow this through.

Actually, the probability of a packet being in error is approximately
proportional to the packet size, since the BIT error rate is constant.
Ignoring digipeaters, an ACK is 19 bytes long and a full-size data
packet is 276 bytes long. This means the probability of case 1 is

more than ten times that of case 2. So for more than 9 out of 10 lost ACKs, the recovery as specified in AX.25 is in fact the optimal one.

This is the worst case analysis, of course. If you have digipeaters (which are a declining feature) or shorter data packets, ACKs are not as small compared to the data packets, and the lost-ACK case makes up a larger fraction, but rarely would it be even close to 50% of the total.

So in short, I'm not convinced this is a case worth worrying about. But if it is, there is a better alternative than ACK acking. Here's why:

ACK acking requires both the sender and receiver to do timeouts. The receiver has to keep a timeout >= the round trip delay -- this is used to generate retransmitted ACKs. The sender has to use a timeout which is at least twice or three times the receiver's timeout since otherwise the sender would retransmit the data before the receiver gets a chance to retransmit the ACK.

The consequence of having the sender use this extra long timer is that in the lost data packet case (which is the majority case, as discussed above) the sender waits far longer than optimal before retransmitting.

Another problem is that there are two timers, one at each station, whose values are tied together; best performance requires that the one is somehow maintained as 2 or 3 times the other so long as the connection is up.

An alternative approach is the one used in DDCMP. Here, the receiver does not have to keep a timer. When the sender fails to receive an ACK for its data packet, rather than resending the data packet it sends a special control packet (REP, for "Reply requested"). When the receiver gets the REP, it responds by resending the latest ACK. The sender then can decide which data packets (if any) have to be retransmitted.

This alternative is better because it does not require the sender to keep an artificially long timeout. The sender can use the optimal timeout (slightly greater than the round trip delay). Also, it is simpler since the receiver does not need to maintain a timer of its own.

On a slightly different subject...

Near the end of his message, Phil describes an alternative protocol that does not use sequence numbers. I agree that the sliding window protocol as in AX.25 is excessively complex (indeed AX.25 is far too complex in lots of places and yet has some serious omissions, but that's for another note). But you can't build a correct protocol without sequence numbers if you use retransmission for error recovery. As a minimum, you need a one-bit sequence number,

as is done in BISYNC. This is necessary because otherwise you can't distinguish these two cases:

1. A sends data packet 1, B acks it, A receives ack, sends data packet 2

2. A sends data packet 1, B acks it, ack is lost, A times out and retransmits data packet 1.

Note that ACK acking doesn't eliminate the problem since case 2 still applies if 2 or 3 acks in a row are lost and A eventually times out anyway.

Phil appears to suggest that you can tell the two apart by having the receiver keep a copy of the last received data packet and comparing this with the next packet. Apart from the fact that this is costly (having to do a string comparison on each packet) it doesn't work because it is perfectly legal to send two consecutive packets with the same data fields.

So minimally you need 1 bit in each direction for a sequence number. AX.25 uses 3 bits, which really makes no difference; the amount of state to be maintained in AX.25 per connection is no different (give or take a byte or two) from that required for the "bare bones" protocol. The reason to argue against AX.25 is not the amount of state info required but rather the unnecessary complexity and the errors in the protocol.

73,
     paul koning, pa0pkg/w1

From 6650497270795374794
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,7e08c9c57b63493,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-03-13 20:55:03 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!linus!philabs!cmcl2!
harvard!think!mit-eddie!KPETERSEN
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: W0RLI Packet Radio Mailbox/Gateway version 11.2
Message-ID: <1272@mit-eddie.MIT.EDU>
Date: Thu, 13-Mar-86 23:55:03 EST
Article-I.D.: mit-eddi.1272
Posted: Thu Mar 13 23:55:03 1986
Date-Received: Sun, 16-Mar-86 10:42:40 EST
Sender: daemon@mit-eddie.MIT.EDU
Organization: M.I.T. EE/CS Computer Facility, Cambridge MA
Lines: 128

From: Bob Clements <clements@BBNCCQ.ARPA>

Version 11.2 of the W0RLI MailBox/Gateway has been released. The binaries and documentation are in PAKT112A.LBR and the sources are in PAKT112B.LBR. These are now available from SIMTEL20 as:

```
Filename          Type  Bytes    CRC

Directory PD:<CPM.PACKET>
PAKT112A.LBR.1              BINARY   108800  5FC0H
PAKT112B.LBR.1              BINARY   145280  75A4H
```

The changes since the last such posting, version 10.0, are summarized below in an extract from the CHANGES.TNC file.

For those who have not seen this system before, a brief description:

The W0RLI MailBox and GateWay is a system which runs on a Xerox 820 computer and which operates on Amateur Packet Radio via one or two TAPR TNCs (or clones). It also runs with TNC-2s (W3IWI is running one).

The W0RLI system is running at over 75 sites in some number of countries and makes up the majority of the packet mail forwarding system. It is also used for gatewaying between local packet areas and long haul links on HF, or to nearby nets on other VHF/UHF bands. For a more complete description, see NOTES.TNC.

Hank is not on ARPANET or Usenet. I will be glad to relay comments and questions to him. If you want the distribution on disk, send a self-addressed stamped 8" SSSD disk (in re-usable mailer) to Hank at his callbook address. Two disks if you want the sources as well. To reduce the load on Hank, I will do the same under the same conditions. I am also good in the Callbook.

73,
Bob, K1BC

ARPANET: CLEMENTS@BBN
Usenet: {ihnp4, decvax, linus, ...}!bbncca!clements

[Extract of CHANGES.TNC follows]

W0RLI MailBox and GateWay Version 11.2

Changes and additions since version 11.1 are:

Added DE (Display Excluded users).
Added KF (Kill all forwarded).
Added KM (Kill Mine) command.
Added LF (list forwarded), LY (list read).
Added P5 Y / P5 N (enable/disable kill after forward).
Moved help and info text out of config, freeing some memory.
Added $V, print changable parameter values.

Changes and additions since version 11.0 are:

No msg of day, very short menu for connect by bbs.

Changes and additions since version 10.7 are:

Added DB - display users maked as BBS.
Added commands to set "allow only bbs" flags from menu:
"P3 Y" or "P3 N" for COMM, P4 same for PRINTER.
Added "allow bbs only" for COMM and PRINTER port.
Added "is a bbs" tag in user record.
Added login count to user record.
GateWay connect to linked station now connects to distant
GateWay, then brings up GateWay and connects to user.
(This is NOT layer 3 ...)

Added "P <call>" - show path to user.
Better command dispatcher.

Changes and additions since version 10.6 are:

Added DL, DS - display local and sysop users.
Removed "call back" "is bbs" "mail drop" from user record.
Beacon got non-local calls, fixed.
Corrected error detection on S and M commands.

Changes and additions since version 10.5 are:

Added log file buffering.
Added WA, WN, WS, AN, AS commands for file management.
Added "N" command, user set own name.
Removed extra writes of mail file header.
W now lists $sys files if SYSOP.
M command now parses @ and < correctly.
Download of $sys files not allowed.
Parallel printer code from k4nta into cbios.mac
Addition of "B" command to GateWay menu.

Changes and additions since version 10.4 are:

Fix "EF" crash on insert of blank line.
Addition of M command in gateway mode.

Changes and additions since version 10.2 are:

New user record not written until exit. Bad data if gate used.
Addition of "EF" simple file editor.
Bug fix, P1, P2 trashed "illegal call" flag.
Beacon line now not show calls with msgs that will forward.
V now gives "*** Done" when it finishes.
Corrected handling of DEL for BS.
Change to CBIOS.COM to do xon/xoff flow control.
Fixed wrong msg # in svc msg text.

Changes and additions since version 10.0 are:

Service msg was not logged correctly.
Added RM command: "Read Mine".
Added k1bc's "P" command.
Added optional call and I qualifier to X command.
FWD.TNC parsing now ignores leading blanks, all text after call.
Added MAIL.BAK and USER.BAK to configuration file. Can specify drive.
Fixed loss of timeout if con req during disconnect sequence.
Treat DEL same as BS from TNC.
Added V command: copy file.
Added logging for local user functions, switch in config to turn off.
Call with all blanks hung system at connect. Fixed.
Allow all legal file name chars.
Zero digi allowed NO connects, fixed.
Seperate "max digi counts" for each port.
Max calls in "unread mail" list in config.tnc.

[End of extract]

From -7042330181469427559
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,78b3f9f2f8b81315,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-03-14 08:36:07 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!decvax!decwrl!amdcad!amdimage!
prls!philabs!cmcl2!harvard!think!mit-eddie!clements
From: clements@bbnccq.arpa
Newsgroups: net.ham-radio.packet
Subject: ARRL Bull #19: Packet gets a reprieve
Message-ID: <1275@mit-eddie.MIT.EDU>
Date: Fri, 14-Mar-86 11:36:07 EST
Article-I.D.: mit-eddi.1275
Posted: Fri Mar 14 11:36:07 1986
Date-Received: Mon, 17-Mar-86 03:56:01 EST
Sender: daemon@mit-eddie.MIT.EDU
Organization: M.I.T. EE/CS Computer Facility, Cambridge MA
Lines: 30

From: Bob Clements <clements@bbnccq.ARPA>

Hr ARRL Bulletin Nr 19 From ARRL Headquarters
Newington CT March 14, 1986, Edited by K1BC
To All Radio Amateurs BT

VHF packet radio got a big boost today. At ARRL request, the FCC
suspended parts of its rules to permit third party traffic by packet
stations under automatic control. Several conditions are attached to
the waiver. Provisions of Sec 97.80(b) and 97.114(b)4, which were both
to be added to the rules March 14, are waived to permit Amateur

stations retransmitting digital packet radio communications on 50 MHz and higher bands using AX.25 or compatible protocol to be operated under automatic control while retransmitting third party traffic.

This waiver applies only to the retransmission of third party traffic originated at another Amateur station which is under local or remote control. When an Amateur station is operated under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules when the control operator is not present at the control point of the Amateur station. This waiver will remain in effect until the Commission takes final action on the petitions for reconsideration filed in PR Docket 85 105.

Amateur packet operators must be alert to the increased dependency upon them for monitoring during the period of this waiver. They should immediately make known to the responsible control operator of an automatic packet station any misuse of his station so the licensee can take corrective action. In summary, VHF packet radio may continue under automatic control. AR

From 6016707029700869376
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6950c286f84aed9c,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-03-15 10:20:37 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Text of FCC Order
Message-ID: <50@petrus.UUCP>
Date: Sat, 15-Mar-86 13:20:37 EST
Article-I.D.: petrus.50
Posted: Sat Mar 15 13:20:37 1986
Date-Received: Sat, 15-Mar-86 22:33:56 EST
Organization: Bell Communications Research, Inc
Lines: 116

Posted: Sat Mar 15, 1986 1:05 PM GMT Msg: OGIG-2422-5637
From: PRINALDO
To: DOCS
Subj: Text of FCC waiver

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)

Waiver of Section 97.80(b) and 97.114(b)(4) of the Amateur Rules to Permit the Retransmission of Third-Party Traffic in Certain Situations	)))))	PR Docket No. 85-105

ORDER

Adopted: March 14, 1986 Released: March 14, 1986

By the Chief, Private Radio Bureau:

1. On February 28, 1986, the American Radio Relay League, Inc. (ARRL) filed a petition for Extraordinary Relief requesting the Commission to temporarily waive Sections 97.80(b) and 97.114(b)(4) of the Rules to permit amateur stations operating in a packet radio network under automatic control to retransmit third-party traffic. The requested waiver would terminate when the Commission adopts a final Order disposing of the petitions for reconsideration filed in PR Docket No. 85-105.[1] In that proceeding, the Commission authorized automatic control for stations transmitting digital communications on amateur frequencies above 50 MHz, but noted that the transmissions of third-party traffic by such stations would require the supervision of the control operator.[2]

2. The prohibition against unsupervised third-party traffic has served to ensure that amateur facilities and frequencies are not used by non-amateurs. Only a person who has demonstrated the proper qualifications may be a control operator of an amateur station. Such control operators screen any third-party traffic to prevent transmissions which are prohibited by Subpart E of the Amateur Rules.

3. Those prohibitions include, but are not limited to, business communications, secret messages, radiocommunications for unlawful purposes and radiocommunication with nations which have not assented to third-party traffic. Self-policing has long been a cornerstone in the integrity of the amateur service. The presense of the responsible licensed control operator at each station has been a vital element in the amateur self-policing tradition. But ARRL, in the instant petition and in its related petition for reconsideration in this proceeding, argues that this safeguard is neither practical nor effective in the context of packet radio technology.

3. In support of the instant petition the ARRL said that the effect of application of traditional third-party traffic control operator requirements to amateur packet radio would severely limit the development of this network for the rapid and accurate relaying of messages and data. The ARRL requested the waiver only for packet radio digital communications using, or compatible with, their AX.25 protocol.[3] The waiver requested by ARRL only relates to the retransmission of messages already properly screened; a control operator will still be required at every amateur station introducing messages into a packet radio system.

4. In view of the above, we believe a temporary waiver is in order until the Commission has evaluated the arguments presented in the subject petitions for reconsideration and issued a ruling on them. Packet radio in the Amateur Service is in the developmental stages. Although interest in this area is intense and growing, there are still only about 14,000 stations, or about 3% of those licensed, equipped for packet radio operation. Thus the risks of abuse are minimized by the small scope of packet operation which will obtain during the period of this waiver. In the interim, more experience can be gained with automatic control of stations retransmitting with the AX.25 protocol.

5. Accordingly, the waiver request of the ARRL IS GRANTED to the following extent:

(a) The provisions of section 97.80(b) and 97.114(b)(4) are waived to permit amateur stations, retransmitting digital packet radio communications (see Section 97.69) on frequencies 50 MHz and above, using the AX.25 (or compatible) protocol, to be operated under automatic control while retransmitting third-party traffic. See Section 97.3(v).

(b) This waiver applies only to the retransmission of third-party traffic originated at another amateur station which is under local control or remote control. See Section 97.3(m).

(c) When an amateur station is operated under automatic control, devices must be installed and procedures implemented which will ensure compliance with the rules, when the control operator is not present at the control point of the amateur station. See Section 97.80(a).

(d) This waiver will remain in effect until the Commission takes final action on the petitions for reconsideration filed in PR Docket 85-105.

6. Control operators of amateur stations capable of monitoring AX.25 packet transmissions must be alert to the increased dependency upom them for monitoring during the period of this waiver. We call upon them to immediately make known to the responsible control operator of a station retransmitting communications under automatic control any misuse of the station so that the control operator can take prompt corrective action.

[Signed]
Robert S. Foosaner
Chief, Private Radio Bureau

[1] Report and Order in PR Docket No. 85-105, adopted January 13, 1986; FCC 86-18; 51 Fed. Reg. 3069, January 23, 1986.

[2] See Sections 97.69(d) and 97.114(b)(4) of the Amateur Rules.

[3] See AX.25 "Amateur Packet Radio Link-Layer Protocol": Version 2.0, Copyright 1984 by the American Radio Relay League; October 1984.

From 5073561299928918353

X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,88375ddc8f77a0e,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,88375ddc8f77a0e,start
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1986-03-18 08:00:49 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/17/84; site inuxi.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!inuxc!inuxi!wheatley
From: wheatley@inuxi.UUCP (Steven Wheatley)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: ARRL BULLETIN 19 (FCC RULE SUSPENSION re digital packet radio)
Message-ID: <302@inuxi.UUCP>
Date: Tue, 18-Mar-86 11:00:49 EST
Article-I.D.: inuxi.302
Posted: Tue Mar 18 11:00:49 1986
Date-Received: Wed, 19-Mar-86 05:16:43 EST
Distribution: net
Organization: AT&T Consumer Products, Indianapolis
Lines: 29
Xref: watmath net.ham-radio:3948 net.ham-radio.packet:246

qst de k9eui
hr arrl bulletin nr 19 from arrl headquarters
newington ct march 14, 1986
to all radio amateurs bt

amateur radio got a big boost today. at arrl request, the fcc suspended part of its rules to permit third party traffic by packet stations under automatic control. several conditions are attached to the waiver. provisions of sec 97.80 b and 97.114 b 4, which were both to be added to the rules march 14, are waived to permit amateur stations retransmitting digital packet radio communications on 50 mhz and higher bands using ax.25 or compatible protocall to be operated under automatic control while transmitting third party traffic. this waiver applies only to the retransmission of third party traffic originated at another amateur station which is under local or remote control. when an amateur station is operated under automatic control, devices must be installed and procedures must be implemented which will ensure compliance with the rules when the control operator is not present at the control point of the amateur station. the waiver will remain in effect until the commission takes final action on the petitions for reconsideration filed in pr docket 85 105. amateur packet operators must be alert to the increased dependency upon them for monitoring during the period of this waiver. they should immediately make known to the responsible control operator of an automatic packet station any misuse of his station so the licensee can take corrective action. in summary, vhf packet radio may continue under automatic control. ar

From -1868006396458213255
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,38bc5bfd373c202
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1986-03-18 16:01:15 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!bellcore!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Re: Link layer thoughts
Message-ID: <58@petrus.UUCP>
Date: Tue, 18-Mar-86 19:01:15 EST
Article-I.D.: petrus.58
Posted: Tue Mar 18 19:01:15 1986
Date-Received: Wed, 19-Mar-86 05:29:05 EST
References: <1655@decwrl.DEC.COM>
Organization: Bell Communications Research, Inc
Lines: 52

This is in response to Paul Koning's article of 13 March 1986 commenting on my posting in December on an experimental new link layer protocol.

That posting represented my ideas at a very early stage; WB6RQN and I wrote a paper for the 5th ARRL Computer Networking Conference that incorporates a revised version of the protocol as part of a larger paper on link level performance issues. Some of your questions and/or objections are answered in the final paper; it's available as <chepponis>ack-ack.ms (ms macro source) or <chepponis>ack-ack.txt (printable output) on c.cs.cmu.edu; use anonymous FTP.

You are correct that my assumption of equal loss probability for data and ACK packets is probably too optimistic. However, I do not agree that "there is in fact little benefit from the proposal". Most packets are lost due to collisions, not random thermal noise, so the relationship between packet size and loss probability is not as clear. Monitoring the local packet radio frequency reveals a LOT of unnecessary data packet retransmissions, for whatever reason. ACK-ACK would clearly help in this case. On the other hand, given a choice I would certainly prefer to have channels so good that ACK-ACK wasn't needed...

Your alternate proposal (the Reply Requested control packet) is already in AX.25 Version Two in the form of the Poll/Final recovery procedures. However, I think that in the very lossy environment for which my protocol is designed, receiver ACK retransmission is more efficient because the sender wouldn't have to send anything to elicit the ACK retransmission. (Remember that the poll can itself be clobbered). My goal in all of this has been to minimize the amount of channel time needed to transfer a given amount of data; since we operate on a shared channel, I consider the delay as seen by one user to be much less important than optimizing the efficiency of the channel as a whole.

It ought to be pretty obvious that our protocol was motivated by the

desire for a simpler and more efficient means of relaying IP datagrams. The host-host (transport level) protocols (e.g., TCP) used atop IP are designed to reject duplicates created by retransmissions within the network. However, a little analysis shows that the number of duplicates would snowball (i.e., increase exponentially) as a packet propagates across a series of links, and performance would be pretty bad. Therefore, the published version of the protocol includes an "ID" field whose purpose is to detect and filter out the majority (but not necessarily all) duplicates caused by link layer retransmission.

Paul, thanks very much for your thoughtful note. Brian and I would be very interested in any further comments after you've had a chance to look over the revised paper, as it contains some further refinements and simplifications I haven't mentioned here. We'd also be interested in hearing your comments on AX.25.

73,

Phil Karn, KA9Q

From 8241608758652154903
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,91eb14363bf0e7c7,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 15e263,91eb14363bf0e7c7,start
X-Google-Attributes: gid15e263,public
X-Google-Thread: 151e61,91eb14363bf0e7c7,start
X-Google-Attributes: gid151e61,public
X-Google-Thread: 129c11,91eb14363bf0e7c7,start
X-Google-Attributes: gid129c11,public
X-Google-ArrivalTime: 1986-05-18 18:08:45 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!rochester!bullwinkle!uw-beaver!ubc-vision!
ubc-cs!ravi
From: ravi@ubc-cs.UUCP (K Ravindran)
Newsgroups: net.ham-radio,net.ham-radio.packet,net.micro,net.micro.cpm
Subject: XEROX 820 for sale
Message-ID: <248@ubc-cs.UUCP>
Date: Sun, 18-May-86 21:08:45 EDT
Article-I.D.: ubc-cs.248
Posted: Sun May 18 21:08:45 1986
Date-Received: Tue, 20-May-86 07:42:21 EDT
Organization: UBC Department of Computer Science, Vancouver, B.C., Canada
Lines: 39
Xref: linus net.ham-radio:3540 net.ham-radio.packet:267 net.micro:13279
net.micro.cpm:5160

********** SALE **********

XEROX 820 single board computer for sale

Features:

- Z80 CPU
- 64K dynamic RAM
- Parallel ASCII keyboard interface (8 bits of parallel data and a key-pressed strobe)
- Floppy disk controller to interface with two Shugart 8" drives or two 5-1/4" drives
- Two independent RS-232 ports
- Real time clock
- 80 X 24 CRT dispaly (5X7 dot matrix) controller for use with an external video monitor (as a console output)
- System monitor (4K) with drive routines for CRT display, keyboard i/o, floppy disk control, and a reasonable command set

Price: US$80.00

Any one interested, send me an e-mail (ravi@cs.ubc.cdn OR ravi@cs.uucp)

From -8584827491182577111
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d553fa7a66a621bc,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 15f443,d553fa7a66a621bc,start
X-Google-Attributes: gid15f443,public
X-Google-Thread: 151e61,d553fa7a66a621bc,start
X-Google-Attributes: gid151e61,public
X-Google-Thread: 126c94,d553fa7a66a621bc,start
X-Google-Attributes: gid126c94,public
X-Google-ArrivalTime: 1986-09-17 15:06:31 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!mnetor!seismo!rochester!kodak!ornitz
From: ornitz@kodak.UUCP (barry ornitz)
Newsgroups: net.analog,net.ham-radio,net.ham-radio.packet,net.wanted
Subject: Need manual for Telonic sweep generator
Message-ID: <570@kodak.UUCP>
Date: Wed, 17-Sep-86 18:06:31 EDT
Article-I.D.: kodak.570
Posted: Wed Sep 17 18:06:31 1986
Date-Received: Fri, 19-Sep-86 22:19:40 EDT
Reply-To: ornitz@kodak.UUCP (barry ornitz)
Distribution: world
Organization: Eastman Kodak Co, Rochester, NY
Lines: 34
Keywords: manuals/schematics, Telonic SPI-64, SG-599/DRA-6
Xref: mnetor net.analog:859 net.ham-radio:2263 net.ham-radio.packet:336

net.wanted:3878

Appropriate garbage for the line-eater.....

Pardon the posting to the net, but I have exhausted all my other known sources for this information. Perhaps the association with ARPANET will lead to success.

I am in need of operations/maintenance manuals and schematics for an older Telonic sweep generator which I purchased on the surplus market a year ago. This generator was a commercial unit which was purchased by the USAF. The commercial designation was Telonic SPI-64 and the USAF designation was SG-599/DRA-6. It was made by Telonic when they were still in Beech Grove (now known for Wavetek). Telonic says that their records are sketchy for the days before the move to sunny California and that they have no information on the unit. One engineer claimed to have worked on it in his early days, however. USAF informed me that this model was removed from service about ten years ago and that they had never purchased enough of them to issue a Federal manual - the manuals supplied with the units were all that they ever purchased. I have checked with companies who deal in used test equipment, military manual suppliers, etc. with no luck.

I would be very grateful to either buy or borrow a manual from anyone on the net. If either of these numbers rings a bell with you, however faint, please look through your bookcases, closets, storerooms or what have you to see if you might have the last remaining copy in existence. Restoring older pieces of test equipment for functional use is a hobby of mine (i.e. GR, HP, Tek, Collins, etc.) and this generator is too fine a piece to be relegated to the "junque heape." Thanks for your help. 73!

Barry L. Ornitz WA4VZQ
Eastman Chem. Div. Research
Kingsport, TN 37662

Phone: Work 615/229-4904, Home 615/288-7803.

From -8347274401946983591
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6e050596850a1518,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 113641,6e050596850a1518,start
X-Google-Attributes: gid113641,public
X-Google-Thread: 10d0b7,6e050596850a1518,start
X-Google-Attributes: gid10d0b7,public
X-Google-ArrivalTime: 1986-11-18 09:49:48 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Path: utzoo!mnetor!seismo!think!rutgers!sri-spam!ames!ucbcad!ucbvax!cbatt!ihnp4!
ihlpa!wolfordj
From: wolfordj@ihlpa.UUCP (wolford)
Newsgroups: comp.os.cpm,comp.sys.misc,net.ham-radio.packet
Subject: Xerox 820/Big Board developers wanted

Message-ID: <2321@ihlpa.UUCP>
Date: Tue, 18-Nov-86 12:49:48 EST
Article-I.D.: ihlpa.2321
Posted: Tue Nov 18 12:49:48 1986
Date-Received: Tue, 18-Nov-86 22:02:30 EST
Distribution: net
Organization: AT&T Bell Labs, Naperville, IL
Lines: 15
Xref: mnetor comp.os.cpm:21 comp.sys.misc:39 net.ham-radio.packet:375

I am looking for people who are using the Xerox 820 and
especially any one who has done ROM development for it.

I have modified the Big Board Roms to work with the Xerox 820-1
and have several extra drivers to support different types
of keyboards along with booting up from the
serial port.

I am just interested in exchanging ideas and information,

Please send your electronic mail address and any activity
you are using the 820 for.

Jeff Wolford
ihnp4!iwsag!jww

From -4286278695279892382
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,29563d0e705023b7,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-20 14:10:10 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10 5/3/83; site mtunh.UUCP
Path: utzoo!linus!decvax!tektronix!uw-beaver!cornell!vax135!ariel!mtunf!mtunh!jak
From: jak@mtunh.UUCP (Jim Kutsch)
Newsgroups: net.ham-radio.packet
Subject: Gateway vol. 2 no. 2
Message-ID: <503@mtunh.UUCP>
Date: Fri, 20-Sep-85 17:10:10 EDT
Article-I.D.: mtunh.503
Posted: Fri Sep 20 17:10:10 1985
Date-Received: Wed, 25-Sep-85 08:26:03 EDT
Organization: AT&T Information Systems Laboratories, Holmdel, NJ
Lines: 408

Gateway: The ARRL Packet-Radio Newsletter
 Volume 2, Issue 2
 September 4, 1985

 Published by:
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Newington, CT 06111
203-666-1541

Editor:
Jeffrey W. Ward, K8KA

TNC 2 HITS THE MARKET

The long-awaited Tucson Amateur Packet Radio (TAPR) TNC 2 went on sale August 19, as scheduled. Volunteers staffed the TAPR office from 9 AM to 9 PM throughout the week, and at the height of the ordering rush, a TNC-2 order was processed every three minutes. The number of phone calls coming into Tucson on the 19th and 20th overloaded the Tucson telephone center several times. Callers had to be both persistent and lucky to place one of the first 300 orders. Those first callers have already received their TNCs. Those that weren't in the first 300 orders will receive their TNCs from a mid-September and an October shipment. TAPR has accepted 832 orders. Packeteers from all over the U.S. and from foreign countries on every continent ordered TNC 2s.

The kits have gone together easily, although IC sockets damaged in shipping and some faulty ICs have hampered the assembly of some TNCs. If you have built a TNC 2 and it passes all tests up to the power-up LED sequence, you may have a bad IC at U13. TAPR has always had a policy of replacing defective parts, and will continue to offer this support. If you suspect that have a bad IC, call the TAPR office and they will send you a replacement 74HC4066. New packaging for the kits should protect IC sockets from damage.

Comments on the documentation, which includes an extensive introduction to packet operation, have been positive. The software, with a real-time clock and a new, more-informative monitor mode, has also gotten good reviews.

Tom Clark, W3IWI, one of the TNC-2 beta testers, has compiled some notes on operating and customizing the TNC 2. These notes are posted on many packet bulletin board systems (PBBSs) around the country, as well as on some telephone BBSs. Further notes, along with suggestions and comments from kitbuilders will appear in the October issue of the Packet Status Register, quarterly publication of TAPR. If you want immediate up-to-the-minute information on TNC 2 and other developments in packet radio, consider joining the HAMNET (part of the Compuserve on-line information service).

Ed.

220-MHz FREQUENCIES FOR 1200 BIT/S

The ARRL is interested in finding out what frequencies are allocated for or used for 1200-bit/s packet operation on 220 MHz. Art Reese, K9XI, editor of 220 Notes would like publish this information so that his readers will know where to expect packet-radio operation. If you are operating at 1200 bauds on 220 MHz, or if a frequency-coordinating body in your area has allocated a channel for low-speed packet radio, send the information to Gateway.

Ed.

CALL FOR PSR ARTICLES

Submissions for the October issue of the TAPR Packet Status Register (PSR) should reach the editor by September 15. The issue will include TNC 2 news, updates on TAPR projects, and discussions of linking hardware and software. Of course, articles covering other topics, especially articles on the history of packet radio, are welcome.

Editor of the PSR is Gywn Reedy, and his address is:

812 Childers Loop
Brandon, FL 33511.

Via DRNET.

PENNSYLVANIA SITES NEEDED

In late July, packet-radio operators from West Virginia, Ohio and Pennsylvania met in Breezewood, Pennsylvania. The meeting was organized by Gary Hoffmann, AK3P, and Bill Stash, WA3AOQ, and was attended by 14 other packeteers. The discussions at the meeting centered on how to link EASTNET to Pittsburgh, Pensylvania, and then into Ohio.

Several of the operators from Ohio reported that they can regularly work east into Pittsburgh, but there is still no link between Pittsburgh and Harrisburg, the western outpost of EASTNET. Those at the meeting agreed that a digipeater at Blue Knob, Pennsylvania, would be ideal. An amateur-radio voice repeater on this site has very good coverage of the central part of the state. Nobody has been able to get permission to place a digipeater on this site yet.

If you have access to a digipeater site that can put a good signal into both Harrisburg and Pittsburgh, please contact

Gary Hoffmann, AK3P
1235 Middletown Road
Hummelstown, PA 17036,

or

Bill Stash, WA3AOQ
421 Daily Drive
North Huntington, PA 15642.

From AK3P.

PACKET SOFTWARE AVAILABLE ON BBS

The W0RLI MailBox/Gateway program and the KE3Z multiport digipeater program are now available for downloading from the Ham Radio Net BBS in Newington, Connecticut. Ham Radio Net, run by Ed Raso, WA2FTC, can be accessed at either 1200 bauds or 300 bauds, and it is usually in service around the clock.

All of the files necessary for configuring and running version 10.0 W0RLI MailBox and Gateway are on the Ed's system, as are all of the files that you would receive if you sent a disk to the ARRL for the multiport digipeater code. These files are stored in File Area 2 of the BBS -- the Packet Radio Section. Because the programs and documentation are large, they have been squeezed and placed in library files. The program that will unsqueeze and separate them is the CP/M utility NULU11. NULU11 is also in File Area 2 on the Ham Radio Net.

Distributing W0RLI's software electronically should allow new versions of the popular MailBox and Gateway to spread rapidly. Hank Oredson, W0RLI, has put a lot of time into support of his software, and the latest release, Version 10.0, has several useful new features.

You can call Ham Radio Net at:

203-665-1114.

Via WA2FTC, KE3Z.

EASTNET UNIX UPDATE

Several improvements have been made to the UNIX-based news and mail gateway run by Jim Kutsch, KY2D. [See Gateway Issue 19.] Jim reports that the system, running as KY2D-2, is now operating 24 hours per day on 145.01 MHz. It can be reached reliably through the WA2VKH, WA2SNA-2 and WB2VTN-1 digipeaters. There are 10 frequent users of KY2D-2 as well as several casual users.

Jim has recently developed and installed software that will accept automatic forwarding of mail and bulletins from systems running the W0RLI MailBox program. Mail received by KY2D-2 can

be further forwarded into the USENET (an international network of UNIX systems), if the correct USENET address is included as the first line of the message.

Right now, mail is accepted only from the WA2VKH MailBox, but the system can be instructed to receive mail from any MailBox. You do not need to modify the W0RLI software in order to forward to KY2D-2.

[UNIX is a trademark of AT&T Bell Laboratories.]

From DRNET.

TUNING INDICATOR FOR HF PACKET

If you are frustrated by the difficulty of tuning in HF packet stations, you may be looking for a good FSK tuning indicator. An interesting crystal-controlled digital tuning indicator is described in an article called "RTTY Tuning: The New Solution," by John Langner, WB2OSZ in the March 1983 issue of 73 magazine. John also discusses the design in the August issue of the NEPRA PacketEar, newsletter of the New England Packet Radio Association. The tuning indicator is actually a simple frequency counter that displays the mark and space frequencies on an LED bar graph. It looks useful, and it should be inexpensive. If you read the article and want to build one of the indicators, Jon has a few PC boards available for $10.

Contact:

John Langner, WB2OSZ
115 Stedman Ct.
Chelmsford, MA 01824.

From The NEPRA PacketEar.

GEORGIA CLUB ADDRESS

The address for the Georgia Radio Amateur Packet Enthusiast Society (GRAPES) that was previously published in Gateway is no longer valid. The new address is:

GRAPES
P.O. Box 1354
Conyers, GA 30207.

Ed.

HF GATEWAY LIST

Don Simon, NI6A, is compiling a list of HF gateway stations. If you operate an HF gateway, even part time, send a letter to Don. Be sure to tell him your station callsign, location, coverage and hours of operation.

Don is also discussing with William Smith, W7GHT, the use of packet radio to pass messages to Australia and New Zealand. The two are looking for HF packet stations that might be able to connect to stations in those countries.

If you can assist with either of these projects, contact:

    Don Simon, NI6A
    2327 Alva Avenue
    El Cerrito, CA 94530.

    From NI6A.

MOBILE RADIO TECHNOLOGY ARTICLE

If you are looking for an article that describes packet radio to people who are familiar with communications but not with amateur radio, look at "Packet Radio Combines Computer, RF Technologies," in the August 1985 issue of Mobile Radio Technology. This article, written by John Gates, N7BTI, describes the basics of packet radio, its advantages, the digipeater and the TNC. The second part of the article will describe packet-radio equipment and applications.

John's article includes a sidebar on the history of packet radio, which shows how radio amateurs have influenced and developed packet-radio technology. At the end of the sidebar, John says that he "believes those of us in the business radio environment would do well to avoid encroachment on [the 220-MHz] and other amateur experimental bands. The results of work carried out on amateur frequencies may yield decided benefits for the commercial sector." The editorial comment in the magazine that carried John's article states: "We welcome the opportunity to tell the story when amateurs help commercial users by way of experimentation. We avoid contrasting amateurs with 'professionals.'"

Packet radio is bringing Amateur Radio a lot of favorable attention from communications professionals. Congratulations and thanks to John Gates and the others who have had papers about amateur packet radio published recently in the professional press.

    Ed.

CONNECTICUT PACKET CLUB FORMED

On September 3, the Southern New England Association of Packeteers (SNAP) adopted a constitution and formally became a club. SNAP hopes to organize the growth of packet radio in Connecticut. The club will meet on the first Tuesday of every month at 7:30 PM at ARRL Headquarters, Newington, Connecticut.

For further information, write:

Jon Bloom, KE3Z
c/o ARRL
225 Main Street
Newington, CT 06111

From WA2FTC.

PACKET DEMONSTRATION

The Society for the Promotion of Amateur Radio Communications (SPARC) will be conducting a packet-radio demonstration in conjunction with its October swap meet. The swap meet will be held on October 19 in Opelika, Alabama. The packet demonstration will be conducted by Bob McGwier, N4HY, who will also have some amplitude-compandored single-sideband (ACSSB) gear to display.

Via ASR.

JAPANESE PACKET

The following update on Japanese packet radio comes from Tac Okamoto, N6MBM/JA2PKI. Tac is temporarily living in Irvine, California, and is a regular on Compuserve HAMNET.

"You are interested in packet activity in Japan. Hummmm... Where should I start? A couple of years ago, a group called JAMSAT received a pair of TAPR beta-test TNC boards. As you may know, JAMSAT is a group like AMSAT, working to build the first Japanese amateur-radio satellite, JAS-1. JAS-1 has a packet-radio transponder [See Gateway issue 23]. When TAPR started distributing the TNC 1, JAMSAT bought 6 of them to use as development tools for JAS-1. Those TNCs were also used for JAMSAT's information network, JASNET. JASNET was the first packet-radio net in Japan. Now JAMSAT has finished hardware for two JAS-1 satellites. Yes, JAMSAT has built two JAS-1s. One of them will be launched in August, 1986. [The other one will be a back up. -- Ed.] So, the packet activity in Japan was started by JAMSAT with help of AMSAT and TAPR.

"Can Japanese amateurs buy a Japanese TNC? Yes, they can. A company in Japan bought a manufacturing license from AEA and is making a TAPR TNC 1/AEA PKT 1 clone. The TNC costs around $300.

"How many TNCs are in Japan? I don't know exactly, but there may be 300 or more. Do they send and receive Kanji [Japanese alphabet] via packet? Yes, there is even a a Kanji BBS!"

Via HAMNET.

K9NG MODEM PROJECT

The modem design presented by Steve Goode, K9NG, at the Fourth Amateur Radio Computer Networking Conference generated a lot of excitement among packet-radio experimenters. The 9600-bit/s modem is necessary for planned intercity "trunk lines" or "backbones." Since Steve's presentation at the conference, TAPR has been working on making available a PC board and a kit of hard-to-find parts for the circuit. The project took a little longer than expected, but the PC boards have been tested, and the final package should be ready for shipping before the end of this month. The PC board is designed to connect a TNC and a Hamtronics FM-5 220-MHz transceiver. Other transceivers can be substituted, with appropriate modifications to the modem board. TAPR will not be selling a complete kit of parts for this circuit. The boards will probably come with the critical capacitors and the state-machine PROM. This will not be a step-by-step project for the beginning kitbuilder, but the documentation provided with the board and the article that Steve submitted to the Proceedings of the Fourth ARRL Amateur Radio Computer Networking Conference (available for $10 from the ARRL) should allow experienced builders to assemble and test the modem. When the kits are available, announcement will be made in Gateway and on packet-radio and telephone bulletin boards.

Ed.

HAWAIIAN ERRORS

In the last issue of Gateway, we incorrectly stated that Maui is the largest of the Hawaiian islands. Several people have pointed out that Hawaii is the "Big Island" and Maui is the second-largest Hawaiian island. The link discussed in the Gateway item was between Hilo, Hawaii, and Kalaheo, Kauai. Maui was not involved.

Ed.

GATEWAY ADMINISTRATIVE NEWS

Now into its second year, Gateway is as successful as we had hoped it would be. There are now over 860 paid subscribers to the newsletter, and several hundred officials of NTS and other

ARRL field organizations receiving complementary copies. We believe that another thousand people receive electronic copies of Gateway from packet-radio or telephone bulletin boards.

Now that the summer is over, people will be returning to their shacks and getting back into packet radio. As this activity picks up, don't forget to send us items of interest. Gateway would like to supply up-to-date packet-radio news. To do that, we need to know what is going on in your part of the network. You can send this information via Compuserve HAMNET, DRNET, or through the mail. Just make sure to send it. If you have any comments on how we can better serve you through Gateway, send those along too.

This copy of Gateway was delayed by the Labor Day holiday. Previous issues of Gateway, however, should have been delivered regularly -- none more than a day or so late. If you are having erratic delivery, especially if your Gateway comes via First Class Mail, please send us a letter detailing the problem. If your Gateway is mailed at bulk rate, there is no way to combat delivery delays.

Ed.

REPRODUCTION OF GATEWAY MATERIAL

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From -9045833961316707830
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,b3fc2fc29a34f5fe,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-20 15:05:12 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10 5/3/83; site mtunh.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!drutx!mtuxo!mtunh!jak
From: jak@mtunh.UUCP (Jim Kutsch)
Newsgroups: net.ham-radio.packet
Subject: Gateway vol. 1 no. 25 with index
Message-ID: <501@mtunh.UUCP>
Date: Fri, 20-Sep-85 18:05:12 EDT
Article-I.D.: mtunh.501
Posted: Fri Sep 20 18:05:12 1985
Date-Received: Sun, 22-Sep-85 04:56:39 EDT
Organization: AT&T Information Systems Laboratories, Holmdel, NJ
Lines: 459

Gateway: The ARRL Packet-Radio Newsletter

Volume 1, Issue 25
August 6, 1985

Published by:
ARRL
225 Main Street
Newington, CT 06111
203-666-1541

Editor:
Jeffrey W. Ward, K8KA

TAPR TNC 2 AVAILABLE AUGUST 19

Tucson Amateur Packet Radio has announced that its new TNC 2 will be available beginning August 19. No orders are being taken before the 19th. Orders will be taken by telephone between 9 AM and 9 PM PDT, August 19 through 23, and during regular business hours thereafter. There are 280 TNC 2s on hand at TAPR, and these will be shipped immediately. Another 300 TNCs should be ready to ship sometime in mid-September. When you call to order a TNC, you will be told whether yours is to be part of the first batch or the second batch. The price of the TNC 2, including shipping, handling and credit-card charges will be $200.85. The TAPR phone number is 602-746-1166. Congratulations to the TNC-2 volunteers for completing a significant packet-radio project.

From DRNET.

IOWA ADDRESS CHANGE

The Central Iowa Technical Society (CITS) has a new president and a new address. Contact CITS at:

Richard E. Amundson, WA0FJS
President CITS
4621 SW 2nd St.
Des Moines, IA 50315

From DRNET.

NOTES FROM GLB

Ken Burton, N9CVV, reports the following developments at GLB. GLB will be coming out with two new models, the PK1L and the PK2. The PK1L will be the same as the the PK1, except that it will require just under 40 mA at 12 V. The PK2 is supposed to be entirely new, with some new features. They may also be offering a complete packet station: receiver, transmitter, amplifier and

TNC all mounted in a 19" chassis. Simply add a power supply and you have a rack-mountable digipeater. Ken saw the prototype of a complete 220-MHz network controller. It will run 9600 bits/s and include transmitter, radio/modem and network control computer. GLB would like to hear what the amateur community wants designed into this controller. Write to Ed Jackson or Gil Boelke at:

    GLB Electronics
    151 Commerce Parkway
    Buffalo, NY 14224.

    Via DRNET.

INDEX TO VOLUME 1

This is the final issue of Volume 1 of Gateway. The first issue was printed on August 14, 1984, and in the year since then, we have signed up 730 subscribers. A few hundred League officials and Special Service Clubs receive free copies of the newsletter, and several thousand packet operators and bulletin-board callers get the "electronic edition" of Gateway. Thank you for your support.

A subject index to Gateway Volume 1 follows. The categories are broad, but you should be able to find what you are looking for. All entries under "Clubs" include club addresses. Emergency, NTS and ARES items have been grouped under "Public Service." Back issues of Gateway are $0.50 from the ARRL Publications Sales Department.

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V is the volume, I is the issue and N is the page number.
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From -2436513112494441799
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9f47726498389a07,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-20 15:08:06 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10 5/3/83; site mtunh.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!drutx!mtuxo!mtunh!jak
From: jak@mtunh.UUCP (Jim Kutsch)
Newsgroups: net.ham-radio.packet
Subject: Gateway vol. 2 no. 1
Message-ID: <502@mtunh.UUCP>
Date: Fri, 20-Sep-85 18:08:06 EDT
Article-I.D.: mtunh.502
Posted: Fri Sep 20 18:08:06 1985
Date-Received: Sun, 22-Sep-85 04:56:58 EDT
Organization: AT&T Information Systems Laboratories, Holmdel, NJ
Lines: 394

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HAWAIIAN ISLANDS LINKED

The Maui County ARES Bulletin reports that Maui (the largest of the Hawaiian-islands) and the island of Kauai are now linked by two-meter packet radio. Bill Baisley, KH6S, and Army Curtis, AH6P, made the first inter-island connection, using a digipeater on Mauna Loa. The Mauna Loa digipeater is on 145.05 MHz, operating as AH6P-1.

From WESTLINK.

OHIO LINKING

Thomas Kryza, KB8CI, reports another packet-radio first:

"Perhaps it wasn't an earth-shaking event, but nevertheless, July 14 marked a milestone for Ohio packeteers. Tom Kryza, KB8CI, in Cleveland, and Reggie Brown, KI4UN, in Florence Kentucky (just across the Ohio River from Cincinnati) made the first Cleveland-to-Cincinnati packet-radio QSO. The contact over the 292-mile path lasted about a half an hour. Two digipeaters were used: W8AC in Chardon, Ohio and AD8I in Circleville, Ohio.

"The more than 30 packeteers around Cleveland and Akron are now connecting on a regular basis with Detroit, Youngstown, Pittsburgh and London (Ontario). We are looking for stations in Sandusky and Mansfield to increase the reliability of paths to Toledo and Columbus."

From KB8CI.

IOWA FREQUENCY COORDINATION

From the minutes of the May meeting of the Iowa Repeater Council:

"A motion was made, seconded, and passed that 145.01, 145.03, 145.05, 145.07 and 145.09 MHz be set aside for packet radio. A motion was also made, seconded and passed to change the 220 bandplan to accommodate high-speed data links.

"It was suggested that since we have decided to stay with the 15/30-kHz plan, that we also change the packet-radio subband from the 20-kHz plan to the 15/30-kHz plan so that the entire 2-meter bandplan is consistent. It was decided to study the idea and delay decision until a later date."

From the IRC.

MID-ATLANTIC MEETING

On September 7, the Mid-Atlantic Packet Radio Club (MAPRC) will hold a meeting in conjunction with the Gaithersburg Hamfest. MAPRC is primarily intended to act as a unified voice for packet radio in northern Virginia, Maryland, Delaware, eastern Pennsylvania and southern New Jersey, but anyone who is interested in packet radio is invited to attend.

Saturday was selected to allow a full afternoon of packet-radio discussions without interruption from activities at the Hamfest. The meeting will start around 14:00 EDT, with dinner planned for 18:00. Meeting facilities will be available starting about 13:00 for informal discussions, disk swapping, etc.

The meeting will be at the Baldwin Community Hall in Savage, Maryland. This is within a mile of the intersection of US 1 and MD 32, and it is convenient for travellers coming in on on I 95, US 29 or the Baltimore/Washington Parkway. Detailed directions will be posted on major EASTNET packet bulletin board systems (PBBSs), addressed to the dummy address "MAPRC". Talk-in stations will be on the Maryland FM Association 146.76/.16-MHz repeater and the Columbia ARA 147.135/.735-Mhz machine.

Some of the local packeteers have offered to put up those travelling from afar on modest budgets. These "luxury" accommodations range from tents and RVs to floor space suitable for sleeping bags. To make arrangements, please send your lodging requirements through EASTNET PBBSs to the address BEDS @ W3IWI.

The meeting will address the following topics:
o MAPRC organization. It is time for MAPRC to become a "real" entity.

o The expansion of EASTNET in the MAPRC area. This will include a discussion of 9600-bit/s linking, dual-port digipeaters and the need for funds to get an enhanced network on the air.

What about the proposed TAPR network controller? What is happening with level-3 linking protocols? Will TCP/IP or VC get on the air first? Just what are level 3, TCP/IP and VC, anyway?

o Expansion of EASTNET north, south and west. From Harrisburg north through Williamsport, State College, Allentown, Scranton, Wilkes Barre and into western New York, the links are sparse. Stations in that area are now best reached through southeastern New York. South from Washington there is sparse activity through southern Virginia and a big gap between EASTNET and SOUTHNET. To the west, there is significant activity from Pittsburgh west to Finley, Columbus, Indianapolis and into Chicago. We would like to investigate routes through West Virginia and central Pennsylvania. Anybody with knowledge and ideas about these routes should be prepared to make a presentation. How far away is the Golden Packet award?

o Hardware and new-user discussions. The newest packet radio hardware, the TNC 2 (complete with ALJ-1000), the Kantronics Packet Communicator and the AEA PK-64, will be discussed. Bring your new applications software, especially terminal programs for common personal computers. Time will be allocated for discussing the problems that new users face when coming on the air.

o Frequency-coordination matters, both those within the packet community and external matters like local repeater councils and FCC actions.

o Integration of packet radio into other aspects of Amateur Radio, particularly the National Traffic System, emergency communications and disaster relief. The recent use of packet systems in the California fires has raised questions about emergency communication and emergency preparedness.

o Packet bulletin board system (PBBS) discussion. What's happening on the PBBS front? How do I get a PBBS on the air in my area? How will PBBSs evolve in the next few years? How do RCP/M systems, UNIX hosts and HF Gateways fit into the grand scheme? This will also be a discussion of PBBS coordination.

o DX packet radio, including HF gateways, Oscar 10, PACSAT, JAS 1 and the possible WA4SIR Space Shuttle packet-radio experiment.

As at past MAPRC meetings, these discussions will be in "town-meeting" format; everyone will be encouraged to speak his or her piece. Please let us know if you are going to be able to come to the meeting. Also, contact us if there are items that have been omitted from the discussion topics listed above.

From W3IWI.

VADCG DEVELOPMENTS

Although we don't hear about them often, there are quite a few VADCG TNCs in operation. The latest VADCG news comes from Alan Mar, VE7DPM:

The Sydney (Australia) Amateur Digital Communications Group (SADCG) has taken the VADCG V-2 protocol and the AMRAD implementation of AX.25 for the VADCG TNC and merged them. This allows one VADCG TNC to run both protocols. It is now possible to choose either V-2 or AX.25 from the TNC menu. Since more memory is required when you have both protocols in one TNC, you must modify the TNC to accept larger EPROMs. Alan does not know if the Australians have a version of this software that runs on a VADCG TNC with the AMRAD daughter board.

An interesting feature of this software is the inclusion of a standard TNC-to-user interface. This interface, based on international standards X.3 and X.28, defines TNC operating parameters and provides a protocol for displaying and altering them. The ARRL Ad Hoc Committee on Digital Communications is investigating the adoption of this protocol as an amateur standard. (See the proceedings of the 4th ARRL Amateur Radio Computer Networking Conference for further details.) VADCG devotees have developed a CP/M program that uses the X.3/X.28 interface to transfer binary files. The file-transfer protocol is TNC-independent, and details should be available soon.

Via HAMNET, VE7DPM.

WISCONSIN NEWS

John Corstvet, WA9SOU, from Madison, Wisconsin provides this activity report:

"At the July meeting of the Wisconsin Amateur Packet Radio Association (WAPRA) the club decided to move Wisconsin packet activity from 144.950 MHz to the national packet frequency, 145.010 MHz. Most stations will have already switched frequencies. We are working on a digipeater at North Freedom, Wisconsin, which will link with stations in Madison, Baraboo and Portage. The North Freedom system should be on the air by early September. We are also making plans for a path from North Freedom to La Crosse, from La Crosse to Rochester, Minnesota and then north to the Minneapolis/St. Paul, Minnesota area. If you are interested in more information on WAPRA, their address is:

WAPRA
P.O. Box 1215
Fon du Lac, WI 54935.

Membership dues include a 1-year subscription to Badger State

Smoke Signals, which carries the WAPRA newsletter."

From HAMNET, WA9SOU.

BARE PC BOARDS AVAILABLE

Applied Digital Technology (ADT), of Oxnard, California, is selling bare pc boards for the TAPR TNC 1. The boards, produced from the TAPR artwork, are faithful copies of TNC 1. ADT is also selling the latest TAPR firmware, reproductions of the TAPR manual and some of the hard-to-get TNC parts. According to ADT, the boards are high-quality glass epoxy, solder masked and silkscreened with component locations. The company may produce pc boards for TNC accessories. For further information, contact:

Applied Digital Technologies
2056 E. Sutter Place
Oxnard, CA 63033
805-488-5575.

Via DRNET.

SOUTHNET CONFERENCE II

The Second SOUTHNET Packet-Radio Conference will be held on November 23 and 24. The conference, hosted by the Georgia Tech Amateur Radio Club, will be held on the campus of Georgia Technical University, in Atlanta. Technical sessions will run Saturday from 8:30 to 5:00 and on Sunday from 8:30 to 12:00. There will be an informal get-together on Friday night and an organized dinner on Saturday.

Interested packeteers are invited to make formal or informal presentations on any topic concerning packet radio. If you want to participate, send your name, address, phone number, amount of time needed, a list of audio/visual equipment needed and a brief abstract of your topic to:

Bill Crews, WB2CPV
1421 Hampton Ridge Road
Norcross, GA 30093

From N4CI.

NEW PACKET GROUP IN SOUTH CAROLINA

On Saturday August 10, a group of 10 amateurs met in Columbia, South Carolina to organize a statewide group for hams interested in digital communications. The name for the group is South Carolina Amateur Digital Society or SCARDS. The main purpose of

SCARDS is to provide a forum in which amateur radio digital communicators can get acquainted with each other and exchange information. It will also promote the orderly growth of packet radio and other forms of digital communications in South Carolina. SCARDS will encompass all forms of digital communication, not limiting itself to packet radio. The club will publish a newsletter every 2 months, beginning in September. Items for the newsletter should be sent to editor Al Nelson, KA4YEA.

This item came by way of the GRAPEVINE, newsletter of the Georgia Radio Amateur Packet Enthusiasts. The GRAPEVINE also reports that on the weekend of August 17, a team of hams installed the W4FX-1 digipeater on Sassafras Mountain, the highest point in South Carolina. This digipeater should help fill the gap between EASTNET and SOUTHNET, as it sits midway between packet-radio activity centers in North Carolina and Georgia.

Via W4FX, DRNET.

MULTIPLE CONNECTIONS

If you are interested in experimenting with multiple simultaneous connections from the same TNC, you will be interested in these developments. Multiconnect firmware written by WA8DED is already in use at several sites in California. Version 0.9 of this software (for the TAPR TNC 1 and compatibles) is now available. This software offers the following features: up to four simultaneous connections possible, easy-to-read monitor mode, on-screen calibration, digipeats AX.25 Version 2 frames, separate status display for each connection and a special "host mode" for computer interfaces.

Harold Price, NK6K, also has multiconnect software in the beta-test stage. This is part of the upcoming TAPR TNC 1 Version 4.0 software. Owners of the TAPR TNC 2 will not be left out; Howard Goldstein, N2WX, author of the TNC-2 software is testing multiconnect routines for that TNC. The availability of this software should spur development of multiuser bulletin boards and gateways. It will also provide a basis for experimentation with networking protocols. We are interested in hearing from anyone developing applications that will take advantage of multiple level-2 connections.

Via HAMNET, DRNET.

NEW PACKET CENSUS

The following is both a report and a request from Harold Price, NK6K:

"While southern California isn't always a good place from which to judge how things are going in the rest of the world, it is interesting to note how quickly packet is growing around here. On our Monday-night nets (both voice and digital), we have been getting several new users each week. Most of them are running the Heath HD-4040 TNC.

"TNCs seem to be selling very well. A call to a LA radio store revealed a backlog of orders for AEA TNCs. Heath is sold out of their latest production run, and they are again back ordered. Based on the production schedules the Heath people were talking about at Dayton, this means that they've sold around 1500 TNCs.

"What is the new-user activity in the rest of North America? I would like to do another packet census, so send me any information that you have. Send reports to NK6K @ KD6SQ, via any W0RLI MailBox that can reach an HF GateWay."

From NK6K.

WESTNET PROJECTS

Looking for something to do this winter? This item, which originated at the WA6OSA Packet Mailbox, details the projects underway in WESTNET:

o Tom King, KA6SOX, is developing a 9600-bit/s FSK modem using K9NG technology adapted for use with Midland 220-MHz radios. Tom is also developing modifications for the Midland radios to make them more suitable for WESTNET backbone use.

o Greg Pierro, WA6RWN, and Jerry Brayton, WB6AIE, are developing a CMOS Z80-based processor board for use in remote mountaintop environments.

o Orv Beach, WB6WEY, is enhancing the KE3Z multiport digipeater software and the FAD HDLC daughter board for WESTNET backbone use.

o Andy Cromarty, N6JLJ, is drafting a proposed functional specification for WESTNET networking software.

o Mike Busch, W6IXU, is developing new mailbox software which uses the WA8DED multiconnect firmware. It will support multiple simultaneous connections and will soon include automatic store and forward with other mailboxes. The WA6OSA mailbox will be converting to the new software as soon as it is available.

Via HAMNET.

SOUTHERN CALIFORNIA CLUB ORGANIZES

Packet-radio users in Riverside and San Bernardino counties are organizing the Southern California Amateur Packet Radio Assiciation (SCAPRA). The first Meeting of SCAPRA will be held on August 27, at 7:00 PM, in the lobby-level amphitheater at Loma Linda University Medical Center. A talk-in station will be on the 147.735-MHz LLUARC repeater.

SCAPRA hopes to distribute packet information, coordinate packet activities and promote friendly expansion of packet radio.

For more information, call:

Rod Wertz, WC6T
714-796-2883

From NI6A, HAMNET.

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From 7269806924641390307
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,ef76bf4389ff197d,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-23 09:46:38 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site nrcvax.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!qantel!hplabs!sdcrdcf!
psivax!nrcvax!geoffb
From: geoffb@nrcvax.UUCP (G. Geoffrey Baehr)
Newsgroups: net.ham-radio.packet
Subject: TNC low cost Kit
Message-ID: <286@nrcvax.UUCP>
Date: Mon, 23-Sep-85 12:46:38 EDT
Article-I.D.: nrcvax.286
Posted: Mon Sep 23 12:46:38 1985
Date-Received: Sun, 29-Sep-85 05:33:44 EDT
Reply-To: geoffb@nrcvax.UUCP (G. Geoffrey Baehr)
Organization: Network Research Corp.
Lines: 46
Keywords: TNC kit

I have located a low cost source for TNC 1 kits, information is listed below.

Applied Digital Technology

2056 East Sutter Place
Oxnard, C.A. 93033
Tel : 805-488-5575

ADT has purcahsed the rights to the TNC -1 and offers either bare
PC boards, EPROM'ed software and some of the less common parts.

Also 200 page manual, system manuals etc

They offer upgrades to the EPROM's as new versions become available.

CATALOG LISTING:

TNC1PCB $28.50	Bare PCB, glass epoxy, 2 sided, solder masked, silkscreened with parts layout.
TNC1MAN $16.95	200 Page system manual (includes TAPR Sys Manual)
TNC1EPR $16.95	Quantity (4) 2764 EPROM's programmed with latest TNC code.
TNC1HDL $39.95	Western Digital WD1935 HDLC chip.
TNC1NOV $9.95	52212 Non Volatile RAM .
TNC1FET $1.25	VN10KM High Power VFET for switching

The remainder of the parts in a TNC are easily located at Radio Shack, mainly
caps, resistors and a few diodes. Also some common semi's.

That's it. Enjoy !
P.S. They accept Visa, Master Charge, check, money orders and COD's .

73's

From -2649135245687588183
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d78f845ca052e0cb,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,d78f845ca052e0cb,start
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1985-09-25 07:55:56 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site kodak.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!seismo!rochester!kodak!williams

From: williams@kodak.UUCP (ray williams)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: IC22S on 145.01 --- HELP!
Message-ID: <144@kodak.UUCP>
Date: Wed, 25-Sep-85 10:55:56 EDT
Article-I.D.: kodak.144
Posted: Wed Sep 25 10:55:56 1985
Date-Received: Tue, 1-Oct-85 08:32:24 EDT
Reply-To: williams@kodak.UUCP (ray williams)
Organization: Eastman Kodak Co., Rochester, NY
Lines: 6
Xref: linus net.ham-radio:2680 net.ham-radio.packet:65

Sender:Ray Williams (WA2RYT)

I am interested in setting up my ICOM IC22S on 145.01 mhz. The problem is that
the phase locked loop goes west below 145.5 mhz. Has anyone run an IC22S as
low as 145.01, or can someone point me to a reference (QST, etc.) with
info on moving the PLL down.

Please respond via mail -----> {allegra,seismo}!rochester!kodak!williams

From 7699013952434518514
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,1641854cce3b7f83,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-25 12:16:34 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 (Denver Mods 7/26/84) 6/24/83; site drutx.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!drutx!llh
From: llh@drutx.UUCP (HaymakerLL)
Newsgroups: net.ham-radio.packet
Subject: Gateway Vol 2 Iss 3
Message-ID: <18@drutx.UUCP>
Date: Wed, 25-Sep-85 15:16:34 EDT
Article-I.D.: drutx.18
Posted: Wed Sep 25 15:16:34 1985
Date-Received: Fri, 27-Sep-85 03:45:38 EDT
Organization: AT&T Information Systems Laboratories, Denver
Lines: 397
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Editor:

Jeffrey W. Ward, K8KA

LOW-POWER TNC FROM GLB

GLB Electronics has released its PK-1L TNC. The PK-1L is an enhanced, CMOS version of the successful PK-1 TNC. Running with a CMOS Z80A microprocessor, the PK-1L draws only around 25 ma, and it can even be run on a 9-v transistor battery. GLB engineer Ed Jackson, WB2OIF, estimates that the PK-1L would run for about 20 hours from a 9-v alkaline battery. This TNC should be great for solar-powered operation. As well as supporting all the features of the PK-1, the PK-1L will have an on-board watchdog timer, battery-backed-up RAM to store operating parameters in case of power failure, standard DB-25 connectors for radio and terminal I/O, a bit on the radio connector that indicates whether the TNC is connected, and two spare I/O bits available for later expansion. The TNC comes assembled and tested, in a 4.5 X 6 X 1-inch, all-metal cabinet. It should make a great portable or remote station.

From WB2OIF.

TAPR NETWORK CONTROLLER

The availability of several commercial TNCs has spurred the growth of packet radio. In most areas, several new calls are heard on the air each week, and Gateway is getting between 50 and 100 new subscribers per issue. How will these new users be served by the existing network? Moreover, how will network continue to offer more services in the face of a steadily growing user community? The single-frequency amateur packet-radio network is already nearly overloaded in many metropolitan areas. When the network becomes overloaded, the packet community will look to its experimenters for new hardware and software to keep packet radio growing.

Several groups of experimenters, both formal and informal, are investigating the various hardware and software choices that face the amateur packet-radio community. The necessary software includes protocols for network (also called ISO layer 3) and transport (ISO layer 4) services, and standards for addressing, routing and mail forwarding. Hardware will be needed for sophisticated mountain-top digipeaters, remotely operated PBBSs, satellite teleports and HF-to-VHF gateways. While Gateway is a newsletter and not a technical journal, much of the packet-radio news in the next few months will concern the projects and standards mentioned above. When these topics are covered in Gateway, we will try to define terms as we introduce them, to stick to newsworthy items, and to list sources of more extensive information.

One of the groups interested in what is broadly called "networking hardware," is TAPR. Now that several hundred TAPR TNC 2s have been shipped, TAPR is turning to the design and debugging of a Network Node Controller (NNC). TAPR president Lyle Johnson provides the following overview of the TAPR NNC project.

"To keep everyone in the loop, here is the present status of the TAPR NNC hardware project.

"The schematics are in St. Louis at Interconnections, the company that does all the CAD (computer-aided design) layout work for TAPR. If all goes well, we should have artwork for all three boards by the end of the month!

"Board 1 is the NNC itself. Its present configuration is as follows:

1) HD64180 microprocessor. This is the CMOS Z80 superset chip with on-chip DMA (direct memory access), dual UARTs [for asynchronous communications], 16-bit timers, MMU (memory management unit) [to manage 512 kbytes of memory] and a clock. This is the same microprocessor that is featured in "Build the SB180 Single-Board Computer" in the September issue of Byte magazine.

2) Dual SIO/2s. This allows four channels of HDLC (high-level data link control) capability. [HDLC is necessary for packet operation.] One SIO may be configured (via push-on jumpers) to have either or both of the channels operate DMA.

3) One PIO (parallel I/O) chip. This provides a parallel printer port and several lines to fiddle with (for bells, whistles, buzzers and item 4).

4) A battery-backed-up real-time clock.

5) An SCSI interface, which allows this board to communicate at high speed with other nearby devices. This will allow the NNC to be a smart Level Two "front end" for a later board that can handle all the networking and transport functions when the network outgrows the capacity of the 64180.

6) Eight byte-wide sockets, for 64 kbytes of battery backed-up RAM (bbRAM) with jumper selection for 256k bytes of bbRAM!

7) Eight more byte-wide sockets mapped for 32-kbyte parts...This allows the full 1/2 Mbyte of memory to be put on the board.

8) Expansion interface for Board Three (described below).

"This will run on 5 v, DC and has RS-232 compatible ports for the

two asynchronous channels that are part of the 64180 microprocessor. The serial interface will meet the proposed WESTNET standard.

"But, you may ask, what good is a NNC without modems? Glad you asked that!

"Board Two, to go to St. Louis next week, consists of:

1) Multiple XR2206/XR2211 modems. [Like the modems in existing TAPR TNCs.] Each modem will have a clock generator, a state machine and a tuning indicator. Board size constraints will determine whether we only get two modems or if we can squeeze on four modems per card.

"Yes, these are only 1200-baud (or 300-baud) modems. But, the local users need a port or two to get in (1200 baud) and long-haul stuff is going to be HF for a while to come (300 baud now, perhaps 1200 later).

"Both of these boards to be sized per the WESTLINK standard, so that they can screw on the side of a 5.25-inch floppy-disk drive.

"Why a floppy drive? I'm glad you asked that, too!

"Board Three is a plug-in floppy-disk interface! The I/O is mapped to be compatible with the SB180 to allow a simple port of the "Z" system [disk operating system]. Thus, the NNC can become its own software development engine, and the hard work of placing a decent operating system on the NNC is already done and readily available at a reasonable price.

"If we are lucky, all boards will be laid out by the end of September. Prototype boards should be populated in October, then debugged by hardware types while the software types (I hope) will get cranking on some level-three [networking] software.

"Thank you each and every one for your inputs to date. Keep the comments coming. Happy packeting!"

[If you are interested in what the 64180 microprocessor is like, be sure to read the referenced Byte article. For further, still introductory, discussion of some of the computer hardware concepts introduced in the above item, read chapters 8 and 19 in the 1985 ARRL Handbook. -- Ed.]

Via DRNET.

MAPRC MEETING REPORT

The Mid-Atlantic Packet Radio Council (MAPRC) met on September 11, in conjunction with the Gaithersburg, Maryland, hamfest. The

following item is condensed from a report filed by Mike Chepponis, K3MC, and Bob Hoffman, N3CVL.

The meeting was moderated by Dr. Tom Clark, W3IWI. There were handouts detailing use of the W3IWI PBBS, MAPRC coverage areas an the KY2D UNIX system. There were also a map of EASTNET and a copy of communications between Jeff Ward, K8KA, and Tom Clark, W3IWI, concerning the KE3Z dual-port digipeater software.

About 40 hams were present. The first hour of discussion concerned MAPRC organization. A copy of the proposed MAPRC constitution was distributed and discussed. It was resolved to collect $24 per year membership dues with $50 per year dues for clubs. Clubs would get two votes, and individual members would get one vote. The official purpose of MAPRC is to promote linking in the Mid-Atlantic area and to make funds and expertise available to install and maintain digipeaters. Projects funded by MAPRC will include digipeaters in areas that are critical to network growth, but without large populations of packeteers.

The group then discussed EASTNET and MidNet coverage. Bob Hoffman, N3CVL, distributed copies of a map of MidNet and three possible paths between MidNet and Eastnet were analyzed:

A) Through Northern Pennsylvania and the Buffalo area. This link would enter EASTNET territory at K3RLI in Wilkes Barre, Pennsylvania.

B) Through Harrisburg and into Philadelphia. Gary Hoffmann, AK3P, is already working on this path.

C) Through West Virginia. This route would enter EASTNET at Cumberland, Maryland, via N8FJB, near Martinsburg, West Virginia.

The discussion turned to multiport digipeaters and whether it is best to use the 440-MHz band or the 220-MHz band for 9600-bit/s links. 440 MHz is preferred by some, especially Brian Lloyd, WB6RQN, because high quality commercial gear is available for that band. Groups without well-equipped RF labs have had problems with the Hamtronics FM-5 transceivers used with the K9NG 9600-baud modems. On the other hand, many folks already have some kind of 220-MHz equipment, and Bob, N3CVL, pointed out that there are other 220-MHz transceiver boards that are fairly easy to align. It was also noted that WB4JFI-5 is already on 220 MHz. There was some confusion as to what frequencies are allocated on 220 MHz and 440 MHz for packet. Some people are reluctant to use the high-speed (100-kHz) channels allocated on 220 MHz for narrow-band (20-kHz) modems. Others, pointed out the advantage of being able to change to higher speeds in the future without the need to change channels. It was resolved to use 220 MHz for the backbone.

Will Xerox 820s be used as the backbone boards? [In the near future, the answer is probably "yes," because the multiport digipeater code runs on the Xerox 820. -- Ed.] Discussion was inconclusive, but it was noted that the 820 [since it uses an 8-bit microprocessor] is running out of steam. Possible alternatives are machines based on the 8088, like the IBM PC, or machines with large linear address spaces, like the 68000. When choosing a second-generation networking controller, we must pay close attention to the availability of inexpensive development tools -- in particular, compatible computers on which software can be written and tested.

Brian Lloyd and Phil Karn, KA9Q, discussed some technical aspects of the network. For example, making FRACK [the time that a TNC waits before retransmitting a packet] and DWAIT [the time that a TNC waits after the channel is clear before transmitting] fairly large numbers really helps out on busy or noisy channels. There was some discussion of how present TNCs handle retries and of a couple of bugs in the TAPR TNC-1 software (version 3.3) that add to network congestion.

There are now three UNIX nodes known to be operating on EASTNET. They are run by Phil Karn, Jim Kutsch, KY2D, and Brian Lloyd. Brian gave details on how to get USENET mail onto EASTNET through these systems.

Via HAMNET.

SOUTHNET II UPDATE

We have received further details on the SOUTHNET II conference to be held at Georgia Tech, on November 23 and 24. The featured presentations are:

- Lyle Johnson, WA7GXD, and Pete Eaton, WB9FLW, on the TAPR Network Node Controller.
- Ed Jackson, WB2OIF, from GLB, will discuss the AX.25 protocol, the PK-1 command set and future GLB projects.
- Demonstrations of all available packet hardware.
- SOUTHNET organizational meeting.
- SOUTHNET awards, including the "SOUTHNET Packeteer of the Year."

Technical sessions will include a report on the progress of digipeaters in the SOUTHNET region, an update on the 9600-baud modem, a status report on 220-MHz linking, discussions of various networking proposals, sessions covering the W0RLI GateWay and MailBox, and a roundup of Xerox 820 information. There will also

be an introductory presentation for those just getting started or interested in packet radio. The conference will be capped by a banquet on Saturday evening.

Members of GRAPES, the Georgia Radio Amateur Packet Enthusiasts Society, will provide transportation to and from the airport. Those that need this service should contact Bill Crews, WB2CPV, at least 3 weeks prior to the conference. With super-saver air fares available, you should prepare early to attend SOUTHNET II.

There will be a final mailing of conference information in early November, including a complete agenda, maps of the meeting location and information on sightseeing in Atlanta. To get this information, send an SASE to

Bill Crews, WB2CPV
1421 Hampton Ridge Road
Norcross, GA 30093.

Via DRNET.

CENTER FOR W0RLI ROUTING INFORMATION?

With new W0RLI MailBox and GateWay stations coming on the air frequently, it is hard for sysops (system operators) to keep track of all of the interconnected PBBSs. In order for the system to work, each PBBS must know which of its neighbors to send mail to for every PBBS in the network. While it is not practical to keep track of all PBBS users and their whereabouts, it is a smaller task to keep track of each PBBS and the paths through which it can be accessed. David Dodell, WB7TPY, has suggested that someone maintain a database of MailBoxes and GateWays, allowing sysops to get timely information about new systems and paths. If you have any comments about this, send them via packet to WB7TPY @ K7PYK or put them in the mail to Gateway.

Via HAMNET.

SOUTH TEXAS PACKET

The Texas Tech University Amateur Radio Club will be putting up several new repeaters this fall. One of the machines will be a packet-radio digipeater on 145.01 MHz. Ronald Cole, N5HYH, is in charge of the club's station operations, and he is planning to put a packet-radio bulletin board system (PBBS) on the air to stir up some local interest in packet. The other repeaters to be installed by the Texas Tech club include a duplex repeater dedicated to experimental modes (on 147.38/.98 MHz) and a machine on the new 902-MHz band.

Via HAMNET.

SCANNING DIGIPEATER

In a message from W6CUS-1 PBBS that was posted on CompuServe HAMNET, Don Simon, NI6A, reports that there is now a scanning digipeater serving the San Francisco area. The digipeater, N6IJP-1, is located about 2000 feet above the city of Angwin, California. It scans all packet frequencies between 145.10 MHz and 145.09 MHz, stopping for six seconds on each frequency. Once it has been accessed on a given channel, the digipeater stays on that channel until it has not been accessed for two minutes. If your group would like to have a digipeater that serves occasional contacts on several frequencies, this scheme may be the way to go. For further details on how the scanning digipeater is implemented, contact

Randy Fischer, N6IJP
455 Bay Street
Angwin, CA 94508.

Via HAMNET.

NEW CALIFORNIA DIGIPEATER

A new digipeater in northern California, WA6YNG-1, should provide communications between southern Oregon and Sacramento. The digipeater was installed in the Mt. Shasta area, at an elevation of 7000 feet. Both county and state Offices of Emergency Services cooperated to make this high-altitude site available. Operating on 145.01 MHz, WA6YNG-1 can be reached through W6AMT-7. When the W6AK digipeater comes on the air, WA6YNG-1 will be moving to 145.05 MHz.

Via HAMNET.

HF GATEWAY IN COLORADO

Dave Shavey, K0HOA, now has an HF gateway operating in Colorado Springs, Colorado. Dave is using the W0RLI GateWay software, and provides full service, including message forwarding 24 hours a day. Like most of the other HF gateways, K0HOA is on 14.103 MHz.

We hear that the midwest is not far behind, with the crew at WB9FLW in St. Louis, Missouri, moving quickly to get a W0RLI GateWay and MailBox on the air.

Via N0CCZ, DRNET.

ST. LOUIS MOVES TO 145.01 MHZ

The St. Louis Amateur Packet Radio Club (SLAPR) is moving its packet operation from 147.555 MHZ to 145.01 MHz. This change has been coordinated in Eastern Missouri and Southern Illinois. Our coordination agreement states that the move will be complete by October 15th.

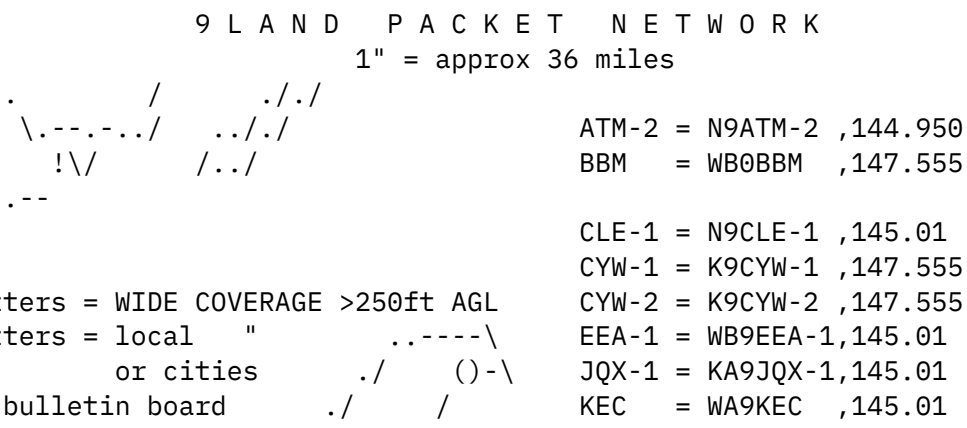
Via WB9FLW, DRNET.

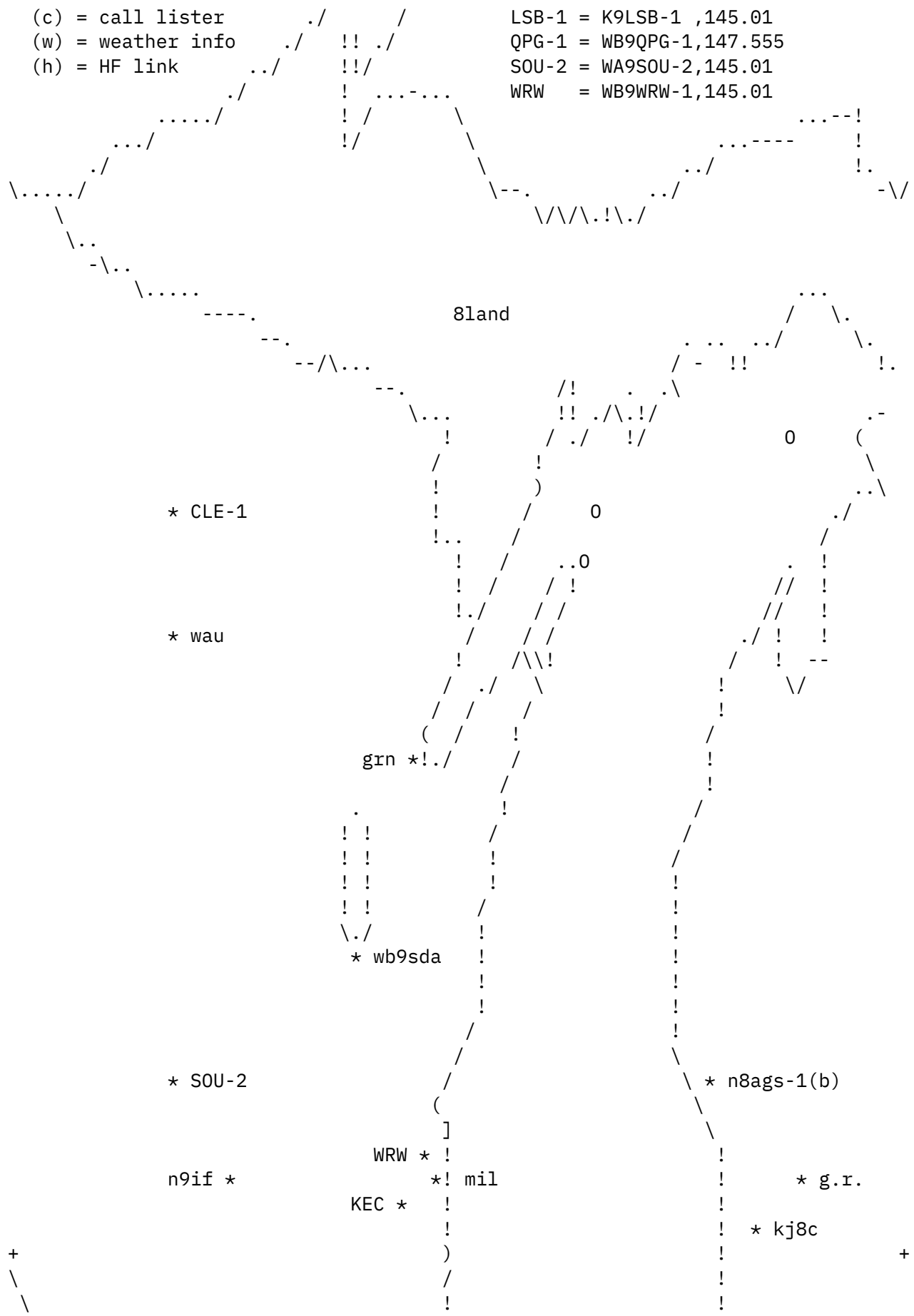
REPRODUCTION OF GATEWAY MATERIAL

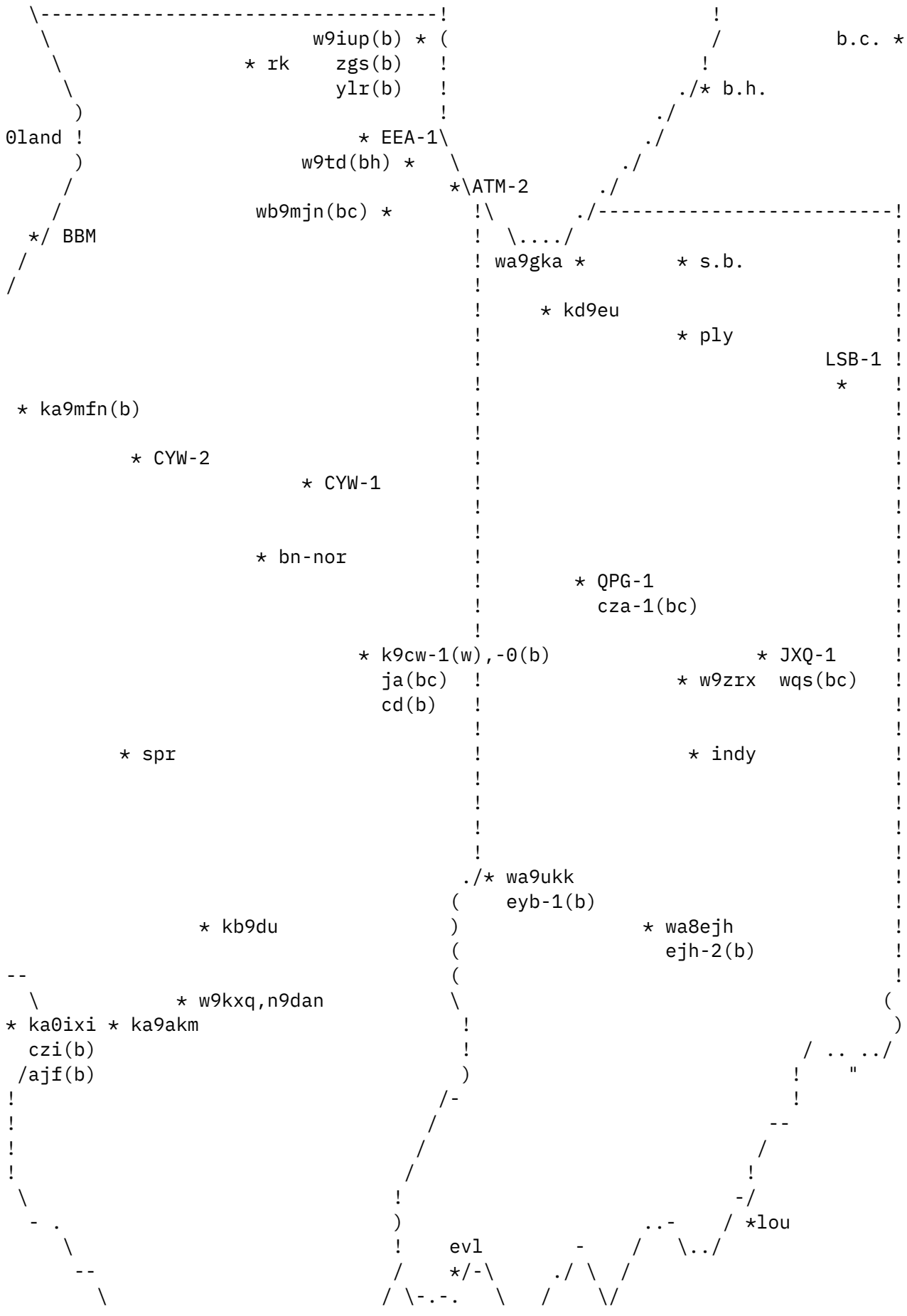
Material may be exerpted from Gateway without prior permission, provided that the original contributor is credited and Gateway is identified as the source.

From -7640035811098272654
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d3ebef004069c46d,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-30 07:48:57 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84 exptools; site ihlpl.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!ihlpl!geewhiz
From: geewhiz@ihlpl.UUCP (Gerald Werner)
Newsgroups: net.ham-radio.packet
Subject: 9 Land Net Map
Message-ID: <360@ihlpl.UUCP>
Date: Mon, 30-Sep-85 10:48:57 EDT
Article-I.D.: ihlpl.360
Posted: Mon Sep 30 10:48:57 1985
Date-Received: Wed, 2-Oct-85 06:40:07 EDT
Distribution: net
Organization: AT&T Bell Laboratories
Lines: 348

---------- 9LANDNET.MAP from WB9MJN ----------


9 L A N D P A C K E T N E T W O R K
1" = approx 36 miles
0land
ATM-2 = N9ATM-2 ,144.950
BBM = WB0BBM ,147.555
CLE-1 = N9CLE-1 ,145.01
CYW-1 = K9CYW-1 ,147.555
CYW-2 = K9CYW-2 ,147.555
EEA-1 = WB9EEA-1,145.01
JQX-1 = KA9JQX-1,145.01
KEC = WA9KEC ,145.01
! UC letters = WIDE COVERAGE >250ft AGL
lc letters = local or cities
(b) = bulletin board


(c) = call lister
(w) = weather info
(h) = HF link
LSB-1 = K9LSB-1 ,145.01
QPG-1 = WB9QPG-1,147.555
SOU-2 = WA9SOU-2,145.01
WRW = WB9WRW-1,145.01
8land
* CLE-1
* wau
grn *
* wb9sda
* SOU-2
WRW *
n9if *
KEC *
*! mil
* n8ags-1(b)
* g.r.
* kj8c


w9iup(b)
rk
zgs(b)
ylr(b)
b.c.
b.h.
0land
EEA-1
w9td(bh)
ATM-2
wb9mjn(bc)
BBM
wa9gka
s.b.
kd9eu
ply
LSB-1
ka9mfn(b)
CYW-2
CYW-1
bn-nor
QPG-1
cza-1(bc)
k9cw-1(w),-0(b)
ja(bc)
cd(b)
JXQ-1
w9zrx
wqs(bc)
spr
indy
wa9ukk
eyb-1(b)
kb9du
wa8ejh
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w9kxq,n9dan
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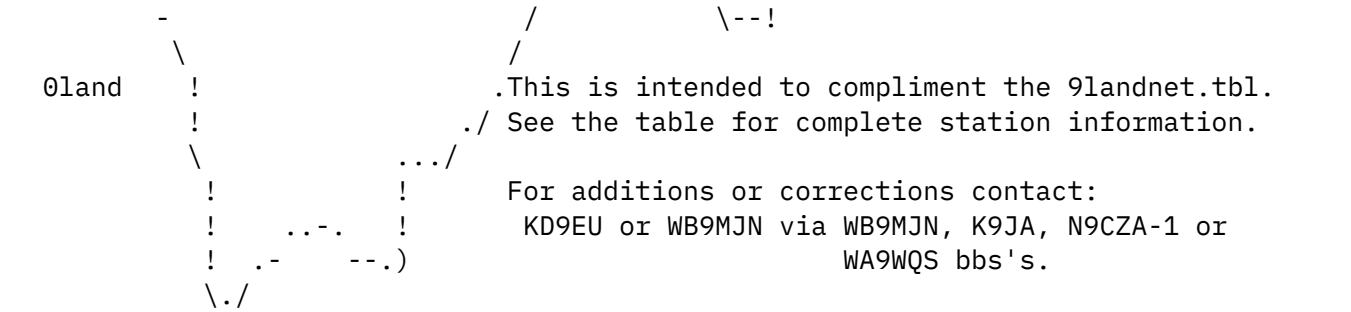
ka9akm
czi(b)
ajf(b)
lou
evl


0land
This is intended to compliment the 9landnet.tbl.
See the table for complete station information.
For additions or corrections contact:
KD9EU or WB9MJN via WB9MJN, K9JA, N9CZA-1 or
WA9WQS bbs's.

Updated 26 Sept, 1985. WB9MJN.

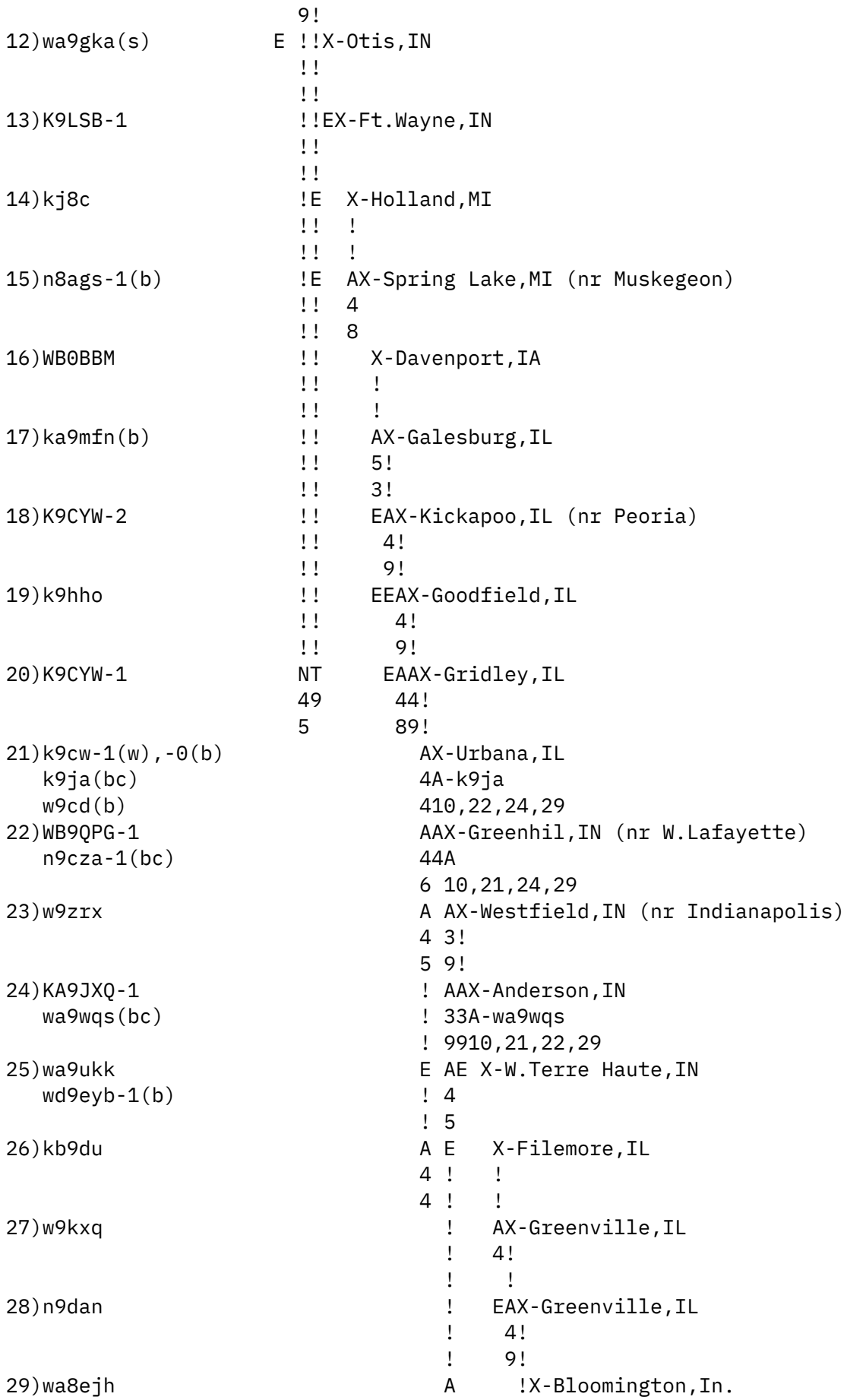
---------- 9LANDNET.TBL from WB9MJN ----------

9th CALL AREA AMATEUR RADIO PACKET NETWORK

```
  #)CALL SIGN            1111111111222222222233333333334444444444555555555566
                 12345678901234567890123456789012345678901234567890123456789012

  1)N9CLE-1      X-Tomahawk,WI


  2)wb9sda        X-Fon Du Lac,WI
    wa4coy        !
                  !
  3)WA9SOU-2      !X-N. Freedom,WI (nr Baraboo)
                  !!
                  !!
  4)n9if          !AX-Madison,WI
                  !!!
                  !!!
  5)WB9WRW        AA!X-Hubertus,WI (nr Milwaukee)
                  33!!
                  55!!
  6)WA9KEC         AAAX-N.Prarie,WI (nr Milwaukee)
    wb9own         333!
                   879!
  7)w9iup(b)          AX-Gurnee,IL
    w9zgs(b)          3H
                      7T
  8)WB9EEA-1       EEEAAX-Dundee,IL
    w9zgs(b)          33!
                      79!
  9)w9td(b)          AAX-Hoffman Estates,IL
                     33H
                     59
 10)wb9mjn(bc)           X-Naperville,IL
                         A-wb9mjn
                         21,22,24,29
 11)N9ATM-2              DX-Chicago,IL (LOOP)
    wb9wbn(b)            4!
```


9!
12)wa9gka(s) E !!X-Otis,IN
!!
!!
13)K9LSB-1 !!EX-Ft.Wayne,IN
!!
!!
14)kj8c !E X-Holland,MI
!! !
!! !
15)n8ags-1(b) !E AX-Spring Lake,MI (nr Muskegeon)
!! 4
!! 8
16)WB0BBM !! X-Davenport,IA
!! !
!! !
17)ka9mfn(b) !! AX-Galesburg,IL
!! 5!
!! 3!
18)K9CYW-2 !! EAX-Kickapoo,IL (nr Peoria)
!! 4!
!! 9!
19)k9hho !! EEAX-Goodfield,IL
!! 4!
!! 9!
20)K9CYW-1 NT EAAX-Gridley,IL
49 44!
5 89!
21)k9cw-1(w),-0(b) AX-Urbana,IL
k9ja(bc) 4A-k9ja
w9cd(b) 410,22,24,29
22)WB9QPG-1 AAX-Greenhil,IN (nr W.Lafayette)
n9cza-1(bc) 44A
6 10,21,24,29
23)w9zrx A AX-Westfield,IN (nr Indianapolis)
4 3!
5 9!
24)KA9JXQ-1 ! AAX-Anderson,IN
wa9wqs(bc) ! 33A-wa9wqs
! 9910,21,22,29
25)wa9ukk E AE X-W.Terre Haute,IN
wd9eyb-1(b) ! 4
! 5
26)kb9du A E X-Filemore,IL
4 ! !
4 ! !
27)w9kxq ! AX-Greenville,IL
! 4!
! !
28)n9dan ! EAX-Greenville,IL
! 4!
! 9!
29)wa8ejh A !X-Bloomington,In.

```
   wa8ejh-2(bc)                    4     !A-wa8ejh-2
                                   4     !10,21,22,24
30)ka9akm                               EA X-Edwardsville,IL
                                         3 !
                                         7 !
31)ka0ixi                               EE AX-Belafontaine N.,MO (nr S Louis)
   wd0czi(b)                               3!
   n0ajf(b)                                 !
32)wa0kgu                                EE AX-Hazelwood,MO
                                            3
```

Notation:

Stations:

Upper Case: Wide Area Coverage Digipeater, All day operation, Omni directional antenna,50 watts 250' above average hieght of covered terrain.

Lower Case: Personal stations left on 24 hrs for linking purposes.

Parenthesis: Letters in parenthises describe additional station functions not used for linking as follows:

- b - computer based message system
- c - call lister
- w - weather information

Routing Information:

X-<Location> : Station column marker, Station in row of marker has a direct link to all stations with entries in the same column as the marker.

Station Linking Functions: These are the characters imediately below the the Station column marker (X).

- H : HF gateway
- HB : Computer based message system with access ports on vhf and hf.
- HT : Computer based message system that is on both vhf and hf at different times.
- HF : Computer based message system with access ports on vhf and hf , gatewaying facilities and autoforwarding on either port. Ala W0RLI.
- A-<call sign> #,#,... : Robotic message handler, Autoforwarding. <callsign> is the call sign of node's autoforwarding station. # is the routing table number of other robotic message handling system(s) or their closest prime link

Link Descriptors: These letters appear in the row and column of the two stations whose link they describe.

- A : Link is available 24 hours a day.
- D : Link is available on a scheduled basis during the

daytime hours only. Typically 10 A.M. to 10 P.M. local time.

N : Link is available on a scheduled basis during the nightime hours only. Typically 10 P.M. to 10 A.M. .

E : Link is possible only during periods of enhanced propagation usually caused by troposheric scattering.

T<#> : Link is only possible via a computer based message system that is changed somehow to provide a link to one of the stations then to the other on a regularily scheduled basis. # is the list number of the computer based message system station or it s closest prime link. T stands for Time Shifted.

! : For the convience of the routing table user exclamation points were added to make columns easier to discerne.

Link Quality Descriptors: Loosely based on the RST signal report system these numbers describe the quality of links. Readabilty is analogued to Traffic effects on thruput and Strength is analogued to the open channel Packet Probability of Reception averaged over a year.

Traffic:

1: 24 hour heavy traffic
2: 12 hour heavy traffic
3: Prime time heavy traffic
4: Occaisional heavy traffic
5: Occaisional light traffic

PPRAY:

1: 10 to 19 %
2: 20 to 29 %
3: 30 to 39 %
etc up to
9: 90 to 99 %

Instructions: Pick out two stations u wish to link between. Look at a complete listing of stations (such as IL.LST) to find the stations' locations. Use 9landnet.map to determine the closest prime link station to the stations. Find the farthest north or west prime link station on the above table. Trace downward from the Station column marker (X) until u find the last station with an A,N,D entry in that column. Then translate right to this station's column marker and repeat the downward trace operation described in the last sentance. Eventually you will come to the closest prime link station to the farthest south or east station. Your link is now the via the first prime link station , any stations where a right shift was made (in sequence) and finally the last prime link station. Other routes are possible by not translating as far as possible downwards before translating to the the right. the link s overall quality may be calculated as shown

below:

```
        Overall Traffic Number  =
                (T1 * T2 *...Tn)/(5**(n-1))

        Overall PPRAY Number =
                (P1 * P2 *...Pn)/(10**(n-1))
```

Please refer any comments, suggestions or corrections to WB9MJN at the WB9MJN bbs, K9JA bbs or the WA9WQS bbs on packet.

Updated 26 Sep, 1985 Don, WB9MJN

The information on this list represents the best guess of the list's compiler at the time of the compilation and in no way is it to be considered faultless.

```
From -7112147153436864015
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9c256f932b44a04b,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-09-30 10:07:53 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!clements@bbnccq
From: clements@bbnccq
Newsgroups: net.ham-radio.packet
Subject: Eastnet damaged by Gloria
Message-ID: <5418@mit-eddie.UUCP>
Date: Mon, 30-Sep-85 13:07:53 EDT
Article-I.D.: mit-eddi.5418
Posted: Mon Sep 30 13:07:53 1985
Date-Received: Wed, 2-Oct-85 20:23:07 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 28

From: Bob Clements <clements@bbnccq.ARPA>
Packet notes from Boston; re: Gloria.

Here is a quick list of outages caused by hurricane Gloria in the
Boston area.  Power outages took W0RLI off the air, cutting the
gateway to most of the rest of the world via HF.  As of Monday
morning, he is still off due to lack of power.  Other important
local digipeaters went off, including KD2S-1, K1EA and WB1EMT-1.
With luck these will be back in a day or two... Massachusetts
utility companies are quoting between 100,000 and 200,000
customers still out in the state.


More serious damage was suffered at N1DL. Karl is our gateway via HF to
Europe. [Hank, W0RLI points his beams west and south. Karl points east.]
Karl's whole antenna farm, VHF and HF, came crashing down.  He will
```

obviously be out of service for much longer. He is also heading
off to BY- and JA-lands on business, which will delay reconstruction
at home.

I was very lucky at K1BC. Power stayed on, even though it was off
in a large chunk of Lexington just north of me, and in many other
neighboring towns. The tree which crashed on my property was kind
enough to miss both my house and my antennas, though I did lose my 80
meter dipole [now restored].

73,
Bob, K1BC

From 3457177624641000936
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e97e57319b0b706f,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-01 08:59:39 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!drutx!mtuxo!mtunh!ky2d-2!
ai2q
From: ai2q@ky2d-2.UUCP (Alex)
Newsgroups: net.ham-radio.packet
Subject: packet meteor shower experiment
Message-ID: <40@ky2d-2.UUCP>
Date: Tue, 1-Oct-85 11:59:39 EDT
Article-I.D.: ky2d-2.40
Posted: Tue Oct 1 11:59:39 1985
Date-Received: Thu, 3-Oct-85 05:22:06 EDT
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 1

*** REPLACE THIS LINE WITH YOUR MESSAGE ***

From 4578857417598114927
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e97e57319b0b706f
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-01 09:09:01 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!drutx!mtuxo!mtunh!ky2d-2!
ai2q
From: ai2q@ky2d-2.UUCP (Alex)
Newsgroups: net.ham-radio.packet
Subject: packet meteor shower experiment
Message-ID: <41@ky2d-2.UUCP>
Date: Tue, 1-Oct-85 12:09:01 EDT
Article-I.D.: ky2d-2.41

Posted: Tue Oct 1 12:09:01 1985
Date-Received: Thu, 3-Oct-85 05:22:21 EDT
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 1

*** REPLACE THIS LINE WITH YOUR MESSAGE ***

From -414138787962880063
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,df554b2e71e72e30,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-01 09:25:55 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site ky2d-2.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!drutx!mtuxo!mtunh!ky2d-2!
ai2q
From: ai2q@ky2d-2.UUCP (Alex)
Newsgroups: net.ham-radio.packet
Subject: meteor shower packet experiment
Message-ID: <42@ky2d-2.UUCP>
Date: Tue, 1-Oct-85 12:25:55 EDT
Article-I.D.: ky2d-2.42
Posted: Tue Oct 1 12:25:55 1985
Date-Received: Thu, 3-Oct-85 05:22:45 EDT
Distribution: net
Organization: KY2D-2 Packet Radio Gateway, Little Silver, NJ
Lines: 33

*** REPLACE THIS LINE WITH YOUR MESSAGE ***

Msg# TR Size To   From   At   Date   Title
- Ack
 527 BN 1167 ALL   WA2RKN AI2Q   850927 Meteor scatter packet experiment
Via WA2RKN: 2327 From WB2KMY Rcvd 850926/2039, Sent 850927/0627
The following information comes from Ed Stephenson AB4S (via IBM VNET):

On October 7 and 8, The Earth will pass through the orbit of comet
Giacobini-Zinner, Jock-o-Benny Ziner, only 25 days after the comet
has passed. Experts have estimated this might produce 6,000 to
10,000 meteors per hour. The Persieds meteor shower that occurs
annually produces about 40 to 60 meteors per hour.

With the advent of packet radio, we have an excellent opportunity to
collect data on the effect of meteor showers on VHF communications.
It is suggested that from 0500Z to 2100Z on October 8, evening of
October 7 local time, packet stations use 145.090 MHz. Set your beacons
for about every 10 seconds and only send the two characters of your state.
Then monitor and capture all incoming beacons.

Please send reports to:
Wake Digital Communications Group

c/o Ed Stephenson AB4S
700 Madison Ave.
Cary, NC 27511

Notes de WB2KMY.....
Why not also include an ARRL Grid Square in addition to the state.
FN31 NY gives a more accurate location.
At AI2Q: Date 851001 Time 1431see

From 7874122215107746772
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,9fa70213fdcc2487,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-02 14:34:03 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!bellcore!
decvax!genrad!panda!talcott!harvard!think!mit-eddie!CHEPPONIS@C.CS.CMU.EDU
From: CHEPPONIS@C.CS.CMU.EDU
Newsgroups: net.ham-radio.packet
Subject: Dual Channel NRZI Encoder/Decoder
Message-ID: <5434@mit-eddie.UUCP>
Date: Wed, 2-Oct-85 17:34:03 EDT
Article-I.D.: mit-eddi.5434
Posted: Wed Oct 2 17:34:03 1985
Date-Received: Sat, 5-Oct-85 07:46:13 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 19

From: Mike Chepponis <Michael.Chepponis@C.CS.CMU.EDU>
Universal Semiconductor Inc. has announced their USC SL2002 Dual Channel NRZI
Encoder/Decoder chip. It is CMOS, in a 22-pin standard DIP, and all inputs
and outputs are TTL compatible. Each of the 2 channels converts NRZ TX data
into NRZI, and also converts incoming NRZI into NRZ; it would seem to be the
perfect chip to mate with, say, the Zilog SIO for use in packet applications.
It replaces the need for the state machine which is now used on many designs.
The chip runs on +5v at 100 uA max quiescent current. It handles 2 Megabits
per second.

Universal Semiconductor Inc.
1925 Zanker Road
San Jose, CA 95112
408/279-2830

N.B.: I have not used this device. I am reciting data from the spec sheet.
Delivery is from stock. Small quantity pricing is $50, but this price should
drop as production ramps up.

From 2131557247472359923
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,d8eea96d1927b4b2,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-07 15:57:26 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site amdimage.UUCP
Path: utzoo!watmath!clyde!bonnie!akgua!whuxlm!harpo!decvax!mcnc!philabs!prls!
amdimage!cmoore
From: cmoore@amdimage.UUCP (chris moore)
Newsgroups: net.ham-radio.packet
Subject: Need info on packet radio
Message-ID: <626@amdimage.UUCP>
Date: Mon, 7-Oct-85 18:57:26 EDT
Article-I.D.: amdimage.626
Posted: Mon Oct 7 18:57:26 1985
Date-Received: Sat, 12-Oct-85 21:53:23 EDT
Distribution: net
Organization: AMDIMAGE, Sunnyvale, CA
Lines: 21

Could someone please tell me where I can find more information
on packet radio? I'd like to build up my own TNC, but I don't
know all the details of how information is exchanged. I have
found out (although I may be wrong) that the modulation is
Bell 202 (1200 bps 1200/2200 Hz), and that data is encoded using
NRZI in SDLC frames. (Am I right so far?) I also have a document
on level 2 AX.25 standard, but its 3 years old and I wonder about
it's accuracy. Any pointers to documentation or help with setting
up a station would be greatly appreciated. I have heard about
the TAPR TNC's, but I'm determined to do this the hard way and
build my own. Thanks in advance.

                  Chris Moore

--

Of course we have backup tapes. Do you want last year or the
 year before?

 Chris Moore (408) 749-4692
 UUCP: {ucbvax,decwrl,ihnp4,allegra}!amdcad!amdimage!cmoore

From -3190742709973447922
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,a2fa7ca5c945be6,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-09 06:13:32 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 (Denver Mods 7/26/84) 6/24/83; site drutx.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!drutx!llh
From: llh@drutx.UUCP (HaymakerLL)

Newsgroups: net.ham-radio.packet
Subject: Gateway Vol 2 #4
Message-ID: <201@drutx.UUCP>
Date: Wed, 9-Oct-85 09:13:32 EDT
Article-I.D.: drutx.201
Posted: Wed Oct 9 09:13:32 1985
Date-Received: Sat, 12-Oct-85 14:09:05 EDT
Organization: AT&T Information Systems Laboratories, Denver
Lines: 405

Gateway: The ARRL Packet-Radio Newsletter
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Editor:
Jeffrey W. Ward, K8KA

PK64 "PACKRATT" SURPRISES

For a couple of months, AEA has been running advertisements for the PK64, a TNC and terminal program for the Commodore 64 computer. None of these ads, however, prepared us for the number of advanced and useful features that the PK64 will display when it is released at the upcoming ARRL National Convention. A discussion with Mike Lamb, president of AEA, revealed that the PK64 will be an integrated digital communications package capable of running CW, Baudot and ASCII RTTY, AMTOR, and packet radio.

AEA did not sacrifice any packet-radio features to make the PK64 cover the other modes. It runs AX.25 Version 2, and can manage up to 10 simultaneous connections. Like the TAPR TNC 2, the PK64 will "stamp" monitored packets with date and time, and you can set the PK64 to accept or reject packets from specific stations. The PK64 can automatically send a message to any station that connects to you. If you want to be out of the shack, but still know when someone connects to you, the PK64 sound an alarm "like a submarine claxon" when you receive a connect request. All TNC operating parameters can be saved in a disk file and retrieved with a single command; up to 10 such "NOVRAM files" can be saved.

The terminal program is like other AEA "MBA-TOR" offerings, providing a split screen display with a status line, a large text buffer and the ability to save, print, edit or transmit the text

in the buffer. One feature that should be useful for those who receive bulletins or messages on RTTY and put them on packet-radio systems is the PK64's ability to receive text on one mode and transmit it on another without using a disk drive or cassette recorder.

The standard modem in the PK64 uses the common EXAR PLL (phase-locked loop) demodulator. HF or VHF tones can be selected from the keyboard, and a tuning indicator is displayed on the screen of the C 64. As an option (necessary for receiving CW), AEA will offer an enhanced demodulator that the user can install in the PK64. This is a dual-channel, filter-type demodulator with AM detector, adjustable squelch and an LED tuning indicator.

We have not seen or operated a PK64, but Mike Lamb promised that some demonstration models will be on display at the ARRL National Convention this weekend in Louisville. With the features described above, the PK64 should make quite an impact on the growth of packet radio.

    Ed.

9600 BIT/S BOARDS AVAILABLE

As reported in several past issues of Gateway, TAPR has been working to make pc boards available for the 9600-bit/s modem designed by Steve Goode, K9NG. After extensive testing, the modem boards are now available. TAPR produced these boards to encourage experimentation with higher-speed RF links. The semi-kit available to experimenters contains a double-sided 3-inch-by-5.4-inch pc board, a set of temperature-stable capacitors for the filters, a programmed state-machine EPROM, a schematic, a parts-placement guide, a parts list and one page of tips on construction and setup of the modem.

Lyle Johnson, WA7GXD, TAPR president, stresses that "This is not a kit in the sense of the complete, we-hold-your-hand variety. It is intended for experimenters. We expect anyone buying this

item to be able to troubleshoot the circuitry, connect it properly to a radio, and share the results with TAPR so that we can share them with everyone else and compile a list of interfaces for various radios."

The price, including shipping prepaid in the United States, is $25.00. Mail your orders to:

    TAPR
    P.O. Box 22888
    Tucson, AZ 85734

    Via DRNET.

PACKET RADIO AND WARM BODIES

[Steve Place, WB1EYI, is manager of the ARRL Volunteer Resources Office. Steve is a packet operator who knows a lot about what keeps Amateur-Radio clubs alive, and he will be writing a series of Gateway articles about what really makes packet successful: people, warm bodies. -- Ed.]

To date, packet activity has been pretty much a celebration of the technology. Though we as users recognize packet's potential, our interest has been in getting a few more stations on the air so we're not always connecting with ourselves, or to fill the gaps in a desired link. The reader of amateur radio magazines has not yet been overwhelmed with exciting articles on "packet radio's realized potential" (this will soon change -- watch QST). Thus, in many people's eyes, packet radio is a technology looking for an application, a solution looking for a problem.

An overstatement? Probably. But not entirely. We're just beginning to see the potential tapped. With the emergence of commercial packet-in-a-box appliances, the techno-klutzes who usually suffer lacerations at the cutting edge of technology are swelling the packet ranks. With the growth in users whose primary interest doesn't lie with the innards of the Packet Black Box (PBB), but simply in communicating more effectively with the PBB, packet radio is approaching a new level of maturity. Yes, packet radio is a solution in search of a problem. But the new users are recognizing countless real-life problems that cry out for efficient, reliable, letter-perfect communications solutions. Odds are that as the user-base grows and we document more and more successful matchings of packet radio to real-life problems, more and more people will want to jump onboard.

Walk Softly and Carry a Big Club

But where does this leave us? If rapid growth among packet users (assuming continued availability of reasonably-priced PBBs and the imminent implementation of a network protocol to handle the

load on the "system") is indeed desirable, what can we do to accelerate that growth? Not only will an expanding base of Packeteers necessitate completion of the networking protocols and establishment of actual links, the growing user base will also support, sustain and justify those links when developed.

One promising answer is to work cooperatively with our fellow packeteers locally in promoting packet radio use -- an organized group working in concert towards a shared goal. A packet radio club (PRC). In the next few issues of Gateway we'll take a look at some of the operational (applications) objectives for packet radio clubs. What are packet users, the heretofore silent majority of packeteers (not to be confused with the hardware and software wizards to whom we all owe a debt of gratitude!) trying to accomplish locally? What has worked for them in getting their neighbors interested in packet? What problems have proved insurmountable? Or better yet, what do you and your buddies as fledgling packeeters want or need to help you overcome the obstacles you've met? You need not be a member of a specialty packet club to find this interesting. Packet radio can be a great communications tool and program focus for your general-interest club as well! To share your ideas, suggestions, strategies, tactics ... as well as problems and complaints with your fellow Gateway readers (the creme de la creme of Packet Junkies), drop me a line via the editor.

SNAP, Crackle and Packet

The Southern New England Association of Packeteers (SNAP), a newly formed club in the ARRL Connecticut Section, has a number of ideas you might find interesting. SNAP is certainly not the model packet radio club -- yet. But it has had to deal with a number of problems that any new PRC must face. First, what are the club's realistic objectives? This isn't as simple as it might seem as "club" translates into "individual members" (emphasis on individual). Beyond the objectives, what do the members of the club really want to do? Objectives are great, but if no one will do the work required to meet those objectives, you're just spinning your wheels.

How did SNAP deal with these issues? That's for the next issue of Gateway (if you tire of reading about SNAP, all you have to do is send in your club's approaches or problems). But to give you a little food for thought:

* How could a club eventually make its ARRL Section a model packet radio section?
* What role could a mobile "hit squad" play in promoting packet?
* How can club meetings meet the needs of the abject beginner as well as the old packet pro?
* What's a PBB Bank?
* What can a club do when the "chips are down?"
* How can you get the word out, and to whom?

* Does NTS have to stand for Naturally Troublesome System when packet radio is mentioned?

As a reader of Gateway, you're demonstrating your interest in packet radio's potential. You have a stake in helping to develop a strong, broad user base. I look forward to hearing from you -- 'til next issue, 73

Steve Place, WB1EYI.

METEOR SCATTER EXPERIMENTS

On October 8, when the earth passes through the orbit of the comet Giacobini Zinner, we may experience a meteor shower with a rate between 6,000 to 10,000 meteors per hour. This is more than one hundred times the rate experienced during showers like the annual Perseids. Packet-radio operators should prepare to take advantage of the propagation this meteor shower may bring.

The ARRL is suggesting that stations use 28.0985, 50.65 and 145.09 MHz for packet-radio meteor-scatter experiments. On 50 and 145 MHz, use 1200-bauds, AFSK on FM (as is usually used for FM packet operation). On 28 MHz, the specified frequency is the center of a standard FSK signal. Conditions should be best on October 8th, from 0500 to 2100 UTC. During this time, W1AW will be on 50.65 MHz, sending a packet every 10 seconds. Stations should send periodic packets containing their grid square and perhaps the UTC time. According to FCC regulations, stations on the frequencies listed above must be under operator, not automatic, control.

If you can, save what you receive, print it out, and send it, along with details of your station, to:

Wake Digital Communications Group
c/o Ed Stephenson, AB4S
700 Madison Ave
Cary, NC 27511.

Ed will be preparing a report on the experiment.

Via K4IWW, W4RI.

TNC-1 SOFTWARE DEVELOPMENTS

This status report on the TNC-1 Version 4.0 software comes from Harold Price, NK6K:

"Many people have asked for a TNC 1 status report. Here is a short one. The most recent problem was that I have been unable to get the 4165 lines of Pascal compiled to 6809 code. The actual

4.0 code itself has been tested under Turbo Pascal on an IBM-PC and is running fine. In addition to fixing all of the bugs reported in 3.x, it implements multiple connects (up to 37 depending on the amount of RAM you have) and most of the new features written up last year and "voted on" by packeeters. Many of those were also implemented on the TNC 2. Most of the new things added on TNC 2 have been included in 4.0 as well. The goal is to have TNC 1 and TNC 2 have compatible command sets. The nice side effect here is that the AEA PK-1 and the Heath HD4040 will also run the new 4.0 code. My wish is to have 4.0 on display at the TAPR booth at the ARRL National Convention. Keep your fingers crossed for good news."

Via HAMNET.

VENEZUELA ON PACKET

Luis Suarez, OA4KO/YV5, sent Gateway a letter describing how packet radio came to Venezuela:

"Packet arrived in Venezuela on September 12th. I bought three TNC 2s from TAPR to start a packet net in Caracas. I assembled the first unit in just five hours and tested the TNC with my Heath H-89 and three different communications programs: REACH11 under HDOS and both TERM and MPLINK under CP/M. Everything worked well and was very impressive, too. The next step is to run demonstration meetings with the help of some volunteers at radio clubs."

From OA4KO/YV5.

TPRS QUARTERLY NEWSLETTER

The Texas Packet Radio Society (TPRS) has launched a new quarterly newsletter, and we just received the first issue of it. It looks like another great packet-radio newsletter, with a mixture of articles of local and widespread interest. The August issue of the TPRS Quarterly Report includes descriptions of the TPRS networking project (TEXNET), TPRS actions as Texas Network Coordinating Agent, a discussion of "bauds" and "bits/s," and the details of the club's venture into software distribution. The software is described in "Terminal Software for the C 64" in this issue of Gateway. For further information on TPRS, write

TPRS
P.O. Box 831566
Richardson, TX 75083-1566.

Via TPRS.

TERMINAL SOFTWARE FOR THE C 64

Commodore 64 owners looking for a terminal program designed for packet radio should check out the TNC64 software now available for a $25 donation to TPRS. This program should provide relief for operators who have been making due with terminal packages tailored for telephone modems.

According to George Baker, W5YR, author of TNC64, the program "implements all TAPR TNC terminal control functions and, by giving access to most of the C-64 memory, the disk drive and a printer, provides additional capabilities that greatly enhance packet operation." Use of machine language for the communications and buffer-management programs allows TNC64 to communicate with the TNC at up top 3600 bauds. This low-level programming also kept TNC64 small, leaving a full 50,000-character buffer.

Other features of the TNC64 terminal program include an "auto-save" mode, which sends all incoming data to a disk file with no operator intervention, extensive plain-language menus and support for a printer.

TNC64 is designed for use with a TAPR TNC, and it runs on a Commodore 64 computer with 1541 disk drive. For further information, write TPRS at the address given above.

Via TPRS.

AUSTRALIAN PACKET PROJECTS

While we have not heard much from Australian packet-radio operators lately, a news release received from the Sydney Amateur Digital Communications Group (SADCG) shows that they have been working on some interesting projects. A TNC will be available from SADCG later this year, and they are accepting orders for packet-radio modem pc boards.

For the TNC, "SADCG has set design objectives around a system that will satisfy most groups. The TNC has improved software handling both Vancouver V.2 and ARRL AX.25 Version 2.

"The SADCG has just completed design of a high performance AFSK modem based on the AMD 7910 World Chip Modem. This modem provides both CCITT and Bell modem frequencies. It is tailored for use on UHF, VHF and HF voice-grade channels, and it incorporates a PTT watch-dog timer. The AMD 7910 was selected because of its abililty to handle noisy conditions as found on HF and satellite operations. [The AMD 7910 is the chip used in the Kantronics Packet Communicator, and a complete construction project using it can be found in the ARRL Handbook -- Ed.]

"This modem will use RS-232/V.24 signals to connect to a TNC or computer. It can be easily hooked to amateur transceivers. The circuit can provide a data-carrier-detect (DCD) output signal from the external radio squelch signal, the internally generated DCD from the 7910, or both. Various connections are available for LED monitoring of such signals as clear-to-send and transmitted data."

The modem pc board and construction information is available for $22 U.S., post free, from:

    SADCG
    P.O. Box 231
    Frenchs Forest
    NSW 2086
    AUSTRALIA.

    From VK2AYD.

AMRAD XEROX 820 INFORMATION

If you need to get a Xerox 820 computer up and running (the surplus Z-80 machines are still available from Xerox) you should look at the August issue of the AMRAD Newsletter. This 20-page newsletter tells you just about everything that you need to know in order to make your 820 run. The how-to-get-it-running articles are supplemented with several items on how to use your 820 for packet, including an interesting "packet-radio answering machine" program by Dave Borden, K8MMO. For details on receiving reprints of the newsletter, contact:

    AMRAD Newsletter
    P.O. Drawer 6148
    McLean, VA 22106-6148.

    Via AMRAD Newsletter.

REPRODUCTION OF GATEWAY MATERIAL

Material may be exerpted from Gateway without prior permission, provided that the original contributor is credited and Gateway is identified as the source.

From 7880732344008231178
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5f449b99016c2d4c,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-12 08:35:21 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP

Path: utzoo!linus!philabs!cmcl2!seismo!harvard!talcott!panda!genrad!mit-eddie!
acardenas.ES@Xerox.ARPA
From: acardenas.ES@Xerox.ARPA
Newsgroups: net.ham-radio.packet
Subject: Re: Need info on packet radio
Message-ID: <71@mit-eddie.UUCP>
Date: Sat, 12-Oct-85 11:35:21 EDT
Article-I.D.: mit-eddi.71
Posted: Sat Oct 12 11:35:21 1985
Date-Received: Tue, 15-Oct-85 04:59:00 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 18

From: acardenas.ES@Xerox.ARPA
GADS, Chris!

Don't re-invent the wheel!... Do take advantage of the Kantronics TNC
sale!...

Built, debugged, ready to go.... $219...   Just LOVE mine! Don't
wait!

I connected the Puppy to my HT and to a Commodore 64 (A cheep
{$50-used} VIC 20 will do) and CONNECT!

Tony Cardenas
WA6IGJ
QA Auditor,
6085 Project.ES

From 3226304434386450849
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e95fa22728626b4d,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-12 11:22:21 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Looking for latest WA8DED code
Message-ID: <638@petrus.UUCP>
Date: Sat, 12-Oct-85 14:22:21 EDT
Article-I.D.: petrus.638
Posted: Sat Oct 12 14:22:21 1985
Date-Received: Mon, 14-Oct-85 04:05:35 EDT
Distribution: net
Organization: Bell Communications Research, Inc
Lines: 8

Some friends of mine are looking for the latest version of the WA8DED rom
code for the TAPR TNC. Unfortunately I didn't keep a copy, and it seems
to have been expired on our system. Can somebody either mail me a copy
or send a pointer (do NOT repost it on the net!)

Thanks,

Phil

From 3538865652826992454
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,a3febbc06d6c38a4,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-12 15:08:06 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site pur-ee.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!mhuxr!mhuxn!ihnp4!inuxc!pur-ee!kk9w
From: kk9w@pur-ee.UUCP (David Andersen)
Newsgroups: net.ham-radio.packet
Subject: HF Gateway Info Wanted
Message-ID: <3391@pur-ee.UUCP>
Date: Sat, 12-Oct-85 18:08:06 EDT
Article-I.D.: pur-ee.3391
Posted: Sat Oct 12 18:08:06 1985
Date-Received: Wed, 16-Oct-85 05:54:33 EDT
Organization: Electrical Engineering Department , Purdue University
Lines: 16

UB 40

I am interested in what you east and west coast types do for HF
gateways. How does the protocol work, and what frequencies, etc.
are used? Can anyone tell me enough to get a gateway on the air?
Here in Hoosierland it seems that we are kind of isolated from
much of what is interesting in packet radio, and even at 300 baud
it might be kind of nice to connect out of here once in a while.

I think that I have all of the equipment necessary to do this, but
I just lack the knowledge. Hot tips, articles, and any other type
of suggestion would all be appreciated.

Thanks,

Dave, KK9W

From -7418221852370124344
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6f6c80422ac13594,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-13 21:04:57 PST

Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!talcott!panda!genrad!mit-eddie!
@DCN6.ARPA:mills@dcn6.arpa
From: @DCN6.ARPA:mills@dcn6.arpa
Newsgroups: net.ham-radio.packet
Subject: IP/TCP bumps and grinds
Message-ID: <78@mit-eddie.UUCP>
Date: Mon, 14-Oct-85 00:04:57 EDT
Article-I.D.: mit-eddi.78
Posted: Mon Oct 14 00:04:57 1985
Date-Received: Tue, 15-Oct-85 07:06:56 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 49

From: mills@dcn6.arpa
Folks,

Over the weekend I cobbled up a driver to connect my LSI-11/73 fuzzball to the Heath HD-4040 TAPR board running the WA8DED firmware in host mode. The driver provides interactive access from the operator terminal to the TAPR board as well as Internet datagram access to our local net and the Internet world. My intent was to bring up an experimental (access controlled) IP datagram gateway in the Washington, DC, area. I found good news and bad.

The good news is that IP datagrams fly quite handily in connection mode. I was able to connect to myself (via the WB4JFI-5 digipeater) and read the mail on my fuzzball via the radio channel, which provoked some solid citizens to ask what I was doing with all those unprintable characters. (Turns out one of the solids was a coordinator for the DDN IP/TCP implementation program!) The flow control and opaque coding problems I had with the orginal TAPR firmware are absent. I was able to change the protocol-id field from the default (F0) to the value assigned for IP (CC), but I doubt this avoided the clutter on the screens of the curious eavesdroppers. I conclude the lashup works in connection-oriented mode.

The bad news is that the drat thing does not play in connectionless mode. The WA8DED firmware apparently refuses to believe the user is interested in U frames as data and presents them as monitoring information instead. I can understand the implementor's reluctance to horse around in this area, since to do it right requires that the level-2 source route and protocol id be available to the host. The WA8DED code attempts to hide all level-2 details, which makes this hard. I would rather the entire packet, along with source route and protocol id, be passed on to the host, instead of just the data field.

As most of you probably know, the WA8DED firmware implements four virtual channels, although they cannot be separately addressed from the radio side. Thus, it should be possible for up to four remote TAPR/IP hosts to connect to an Internet host on the other side of my fuzzball gateway, each on a separate channel. This requires some way to associate return datagrams with the right channel, which will require some sort of dynamic IP-address-to-callsign

mapping table. We Internetters have faced that problem before - with Ethernets and X.121 public nets, not to mention volleyball tournaments.

It may be possible to fool mother nature by peeking at the first octet of the monitoring message and capturing source routes in a configuration table, possibly dynamically updated using the monitor-message header, which is available in formatted form, but such heroics must await another weekend. Meanwhile, if I can flush another LSI-11 rabbit from the underbrush here, the first IP/TCP two-way may yet come to pass.

Dave, W3HCF

From 9083943204898867232
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6f6c80422ac13594
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-14 23:58:27 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.3 4.3bsd-beta 6/6/85; site ucbvax.ARPA
Path: utzoo!watmath!clyde!burl!ulysses!ucbvax!ucbarpa!fair
From: fair@ucbarpa.BERKELEY.EDU (Erik E. &)
Newsgroups: net.ham-radio.packet
Subject: Re: IP/TCP bumps and grinds
Message-ID: <10663@ucbvax.ARPA>
Date: Tue, 15-Oct-85 02:58:27 EDT
Article-I.D.: ucbvax.10663
Posted: Tue Oct 15 02:58:27 1985
Date-Received: Wed, 16-Oct-85 05:20:18 EDT
References: <78@mit-eddie.UUCP>
Sender: usenet@ucbvax.ARPA
Organization: University of California at Berkeley
Lines: 24

I may have missed the point, but why bother running IP over X.25, when
IP (as a pure datagram protocol) is ideally suited to packet-radio?
Of course, I'm somewhat flush with missionary spirit right now,
since I just finished Michael Padlipsky's book,

    ``The Elements of Networking Style''
    (Prentice-Hall, 1985)

It seems to me that if you're the only one doing IP right now, you can
build a superior network up from scratch, which might (if you made it
easy for them) convince the rest of the packet-radio community to
convert by example. I think that it would be terrific to have a public,
ARPANET-style resource-sharing network running over packet-radio,
instead of an X.25 based terminal-to-computer network which that protocol
implies.

Also, by running IP over X.25, you're stuck with the limitations of the
X.25 protocol (e.g. no alternate routing) unless you're doing something

clever that I didn't spot in your description.

On the other hand, since this list is based partially on the ARPANET,
maybe I'm preaching to the converted...

     Erik E. Fair ucbvax!fair   fair@ucbarpa.BERKELEY.EDU

From -6053445003402603852
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6f6c80422ac13594
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-15 08:37:05 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!gamma!epsilon!zeta!sabre!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Re: IP/TCP bumps and grinds
Message-ID: <645@petrus.UUCP>
Date: Tue, 15-Oct-85 11:37:05 EDT
Article-I.D.: petrus.645
Posted: Tue Oct 15 11:37:05 1985
Date-Received: Wed, 16-Oct-85 05:43:30 EDT
References: <78@mit-eddie.UUCP> <10663@ucbvax.ARPA>
Organization: Bell Communications Research, Inc
Lines: 26

> I may have missed the point, but why bother running IP over X.25, when
> IP (as a pure datagram protocol) is ideally suited to packet-radio?

I couldn't agree with you more! The problem is that "AX.25" is a very poor
term to describe the protocol run by the amateur packet radio community.
What we call "AX.25" is really just LAPB (the link layer of X.25) with a
prepended datagram header consisting of amateur callsigns (with optional
source routing through a bunch of digital repeaters, or "digipeaters".) It
does NOT have the Packet Layer from X.25 (as of yet, anyway...and I am
determined to do everything in my power to prevent that from happening.)

It is possible to use "AX.25" in "datagram mode", i.e., by bypassing the
connection-oriented LAPB layer and sending raw packets prepended by the
link-level amateur callsigns. However, amateur packet radio is one
of those few places where link level acknowledgments make sense, because
the links are so unreliable that the chances of a packet making it
successfully down a long chain of them approaches zero asymptotically.

My view of a real amateur packet network involves IP gateways speaking
to their neighbors over AX.25 point-to-point links. If they have excellent
quality RF links, with few collisions, they default to AX.25 unconnected
mode; otherwise they use the link level connect facilities of AX.25 to
increase the chances of each datagram making it to the next node. The
users, of course, speak TCP, and this may be the biggest challenge of all...

Phil

From -5018226355991360737
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,6f6c80422ac13594
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-16 17:59:38 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!brian@SDCSVAX.ARPA
From: brian@SDCSVAX.ARPA
Newsgroups: net.ham-radio.packet
Subject: Re: IP/TCP bumps and grinds
Message-ID: <108@mit-eddie.UUCP>
Date: Wed, 16-Oct-85 20:59:38 EDT
Article-I.D.: mit-eddi.108
Posted: Wed Oct 16 20:59:38 1985
Date-Received: Sat, 19-Oct-85 06:36:49 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 50

From: brian@SDCSVAX.ARPA (Brian Kantor)
Actually, the reason for x.25 under tcp/ip is a practical one only - the equipment is there already. Think of them as error-free radio modems.

By using existing packet radio boxes to implement the point-to-point links in a packet network, we get error-free links between the nodes in the network. If data traversing the network is sent as IP datagrams over such a network, it can be rerouted in true datagram style at each network node, thus giving the flexibility of a datagram based service with the high reliability of connected nodes.

Certainly some other transport mechanism could be used between network nodes. AX.25 boxes exist and will simplify getting a network built. Although they have disadvantages (such as really short maximum packet sizes), their existance and useability means that we only have to build the network, not also design a new transport mechanism for it.

Undoubtably you are aware, Erik, that the Internet Protocol packets are almost never sent in raw form. They are usually encapsulated in an underlying transport protocol such as ethernet, slip, 1822, etc. No, its not exactly ISO 7-layer standard. But this is the real world. And it works well.

There are some philosophical arguments (perhaps they are practical arguements also) as to whether the IP datagram should be generated in the user's equipment, or in the network connection node. You can compare this to whether your terminal at home is using a modem (and thus 212 or 103 protocol) to connect to your vax at work, which generates the IP stuff for you, to the idea of having a standalone system at home that actually makes IP packets and sends them to your vax which gateways them

onto the network (as with a Sun running SLIP, for example).

Both will work just fine. The second requires more processor power in the user's equipment, but provides a much more flexible facility. What we are trying to do in building the ham packet radio network (AMPRNET) is to provide the most flexible, most useable, and least restrictive network we can within a framework of almost no money and complete anarchy. The idea is to accomodate both the dude who just bought a packet box for local communication, and now wants to use the network, and also the guru who has a lot of computing power and builds an IP box. The guru is clearly going to get more out of the network than the appliance operator, but both can use the network.

Gad I've typed a lot before 7 am....

Brian Kantor WB6CYT UC San Diego Network Services Group

decvax\ brian@ucsd.arpa
ihnp4 >--- sdcsvax --- brian
ucbvax/ Kantor@Nosc

From -1590150245115627870
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,575b1c5562ab2c82,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,575b1c5562ab2c82,start
X-Google-Attributes: gid151e61,public
X-Google-Thread: 120a1f,575b1c5562ab2c82,start
X-Google-Attributes: gid120a1f,public
X-Google-ArrivalTime: 1985-10-17 06:24:29 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site cp1.UUCP
Path: utzoo!linus!decvax!ucbvax!ucdavis!lll-crg!seismo!umcp-cs!aplvax!cp1!hart
From: hart@cp1.UUCP (rod hart)
Newsgroups: net.ham-radio.packet,net.ham-radio,net.wanted.sources
Subject: IBM PC PBBS SOFTWARE WANTED
Message-ID: <1115@cp1.UUCP>
Date: Thu, 17-Oct-85 09:24:29 EDT
Article-I.D.: cp1.1115
Posted: Thu Oct 17 09:24:29 1985
Date-Received: Sun, 20-Oct-85 09:01:42 EDT
Distribution: net
Organization: C & P Tel. Co., Baltimore, Md.
Lines: 3
Xref: linus net.ham-radio.packet:83 net.ham-radio:2789 net.wanted.sources:1435

I just recently heard that there is a IBM PC Packet Radio Bulletin Board software package in the public domain. Could someone tell me how I could go about obtaining a copy. Thanks!

From 5780738811302401975

X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,c2fdf7efe53aa6ce,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-17 11:22:55 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!decvax!ucbvax!ucdavis!lll-crg!seismo!harvard!think!mit-eddie!
clements@bbnccq
From: clements@bbnccq
Newsgroups: net.ham-radio.packet
Subject: HF gateways for packet
Message-ID: <121@mit-eddie.UUCP>
Date: Thu, 17-Oct-85 14:22:55 EDT
Article-I.D.: mit-eddi.121
Posted: Thu Oct 17 14:22:55 1985
Date-Received: Sun, 20-Oct-85 08:50:30 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 38

From: Bob Clements <clements@bbnccq.ARPA>
Sorry to bother everyone with this, but my mailer complained
about every address I tried to reach kk9w directly.

Subject: HF gateways for packet
To: kk9w@pur-ee.UUCP

Dave,

The gateways that I am aware of consist of the following:

VHF signal->VHF radio->TAPR TNC->Xerox 820->TAPR TNC->HF radio->HF signal

The TNC connected to the HF radio has slightly modified filters
in its modem, as described in TAPR documents. The HF radio is
run in SSB.   The Xerox 820 runs the W0RLI MailBox/GateWay code.
It allows gatewaying in real time (conversational QSOs) and by
store-and-forward electronic mail.

The W0RLI code is readily available. It runs ONLY on the Xerox 820,
at present.

I won't go into any more detail in this message because I don't know
what parts of this are old hat to you and what you need to learn
more about.

Let me know how I can help.

Now to see if I can route this msg to you....

73,
Bob

K1BC

ARPANET: clements@bbn.arpa
Usenet: {ihnp4|decvax|linus|ima}!bbncca!clements
Phone: 617-497-3612 (work) or 617-861-8622 (home, ans. machine)

From -8895555349958579484
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,863a3b19a3127c01,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-18 12:38:56 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!decvax!ucbvax!ucdavis!lll-crg!seismo!harvard!think!mit-eddie!
@DCN7.ARPA:mills@dcn6.arpa
From: @DCN7.ARPA:mills@dcn6.arpa
Newsgroups: net.ham-radio.packet
Subject: AX.25 and IP/TCP: a status report (absurdly long!)
Message-ID: <131@mit-eddie.UUCP>
Date: Fri, 18-Oct-85 15:38:56 EDT
Article-I.D.: mit-eddi.131
Posted: Fri Oct 18 15:38:56 1985
Date-Received: Mon, 21-Oct-85 05:08:44 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 326

From: mills@dcn6.arpa
Folks,

Following is a longish report on current status and plans of my ongoing project to bring up a demonstration of the DoD Internet protocol suite operating at the network layer above AX.25. I first tried to hack the original TAPR-1 firmware to do this in both connection and connectionless modes, but gave up due to ornery problems in transparency and flow control. I next tried the WA8DED firmware and found some joy, pleasantries of which are reported below. The report is rather technical and intended for those with some protocol background and implementation experience, expecially in the areas of connectionless (datagram-oriented) networks and gateways.

Overview

I rebuilt what has become a monsterous driver for the LSI-11 "fuzzball" system, which is an old grizzly used for network protocol development, testing and performance evaluation and supports just about every protocol sung in the IP/TCP protocol suite. The LSI-11/73 I used for the present purpose (DCN6.ARPA) belongs to me personally and is located in my home along with 30 megabytes of disk, a swamp of radios, towers, a leased digital circuit to the office (hence the Internet) and related mud creatures.

The driver supports both the ordinary connection-mode, stream-ASCII operation commonly used to access BB stations, etc., as well as both connection and

connectionless modes for Internet Protocol (IP) datagrams and its client Transmission Control Protocol (TCP), upon which application protocols like the TELNET virtual-terminal, FTP file-transfer and SMTP mail-transfer protocols are built. The station complement, consisting of TAPR-1, fuzzball and VHF transceiver, is organized as a full-function Internet gateway between subnet 128.4.1, representing the radio channel, and DCNET (128.4), which is itself gatewayed to the Internet via the ARPANET. It should be noted that no traffic capability between the radio channel and the ARPANET is expressed or implied in this document and that all traffic between the radio channel and any other nets reachable via nongovernment paths (Ford, U Michigan and U Maryland at present) is experimental and strictly noncommercial in nature.

The WA8DED Firmware

The WA8DED firmware ex box provides one connectionless-mode channel and five connection-mode channels, which can also be operated in connectionless mode. The TAPR is operated in host mode; that is, the fuzzball has to poll for everything, which it does at one-second intervals on all five channels. This handles the flow-control problem from the TAPR to the fuzzball. Since my TAPR is fully populated with memory (about 700 buffers) and TCP manages end-end flows anyway, I didn't bother with flow control from the fuzzball to the TAPR.

Host messages to the TAPR consist of the sequence

    <channel number> <control code> <count> <text> ,

where <channel number> is an octet in the range 0-4, <control code> is an octet with value 0 for data and 1 for command, <count> is an octet representing the number of octets in <text> reduced by one and <text> is a string of up to 256 octets with no restriction on code combinations. Commands are in ASCII and are interpreted the same way as in ordinary (i.e. non-host) mode, except that the terminating <CR> is not included. No more than one command can be sent in a message and commands may not be split between messages. In the case of IP datagrams, the raw datagram itself is simply encapsulated in the <text> field as-is.

TAPR messages to the host have the same format as above, except that <control code> is an octet with values in the range 0-7, indicating success/failure, as well as status information, headers and data.

    0   normal response to command (no <count> or <text> field)
    1   normal response to command
    2   error response to command
    3   link status information
    5   monitor header
    6   monitor data
    7   user data

In all except codes 0,6-7 the <text> field is <NUL>-terminated. Codes 0-2 occur only in response to commands, while the remainder can occur spontaneously (but only in response to a poll, of course). Codes 5-6 apparently occur only on channel 0, while code 7 occurs only on channels 1-4. This creates problems in connectionless mode as described later. In the case

of code 5 the <text> field consists of an internally formatted representation of the AX.25 header, which is followed immediately by the data (if present) as a code 6.

Upon initializatin the driver sends the sequence

<NAK><ESC>JHOST 1<CR> ,

which toggles the TAPR into host mode, if not already there, and is grumpily ignored if it is. The polling sequence, which is sent every second, consists of the five commands

<0><1><0>G <1><1><0>G <2><1><0>G <3><1><0>G <4><1><0>G ,

which empties the TAPR queues at a rate limited to one message per second on each channel. When lots of things are going on, such as when monitoring all channel traffic and managing a connection or two, the TAPR queues start to back up. The polling strategy and rate matching can obviously be improved.

Connection Management

The WA8DED firmware assigns incoming connection requests serially starting at channel 1 and continuing to channel 4 or a limit which can be set by a command. Completion of the handshake sequence results in a link status (code 3) reply on the assigned channel. Outgoing connection requests can be made on any channel as specified by the connect "C" command. In the case of channels 1-4, the request results in the AX.25 connection-setup procedure, while in the case of channel 0, the request specifies the route for subsequent connectionless (UI) frames.

If a data message is sent on channel 0 or on any other channel not preceded by a connect command, the data is sent as a UI frame. Connection data (I frames) appear as code-7 replies on the assigned channel and can be interleaved with data from other channels. Connectionless data (UI frames) can apparently be received only as monitoring data when enabled by the monitor "M" command and are preceded by a code-5 message indicating the route and protocol id. The protocol id can be changed by a command, but only on a global basis.

An AYT (ARPANETese for "are you there" aka "keep-alive") consisting of the RR supervisory message, is sent every two minutes on every active connection. If the max-retransmission counter is exceeded the TAPR attempts to reset the connection while holding on to the channel queues; however, if that fails the connection is aborted with an appropriate link status message. This can result in delays up to several minutes before the link-level protocol gives up and obviously will result in congestive collapse in retransmissions with conventional transport-level implementations.

The W3HCF Fuzzware

The TAPR driver constructed for the fuzzball can operate with both ASCII streams or IP datagrams in either connection or connectionless modes. The driver has an interface to the stream-oriented terminal I/O, so that local terminals and remote network (TELNET) terminals can connect via the driver and

TAPR to AX.25 stations in the ordinary way. Using this interface, if the first character in a line terminated by <CR><LF> is <ESC>, the line is interpreted as a command, rather than data. If the first character of the command itself is a digit, the selected channel is changed accordingly and remains in effect. In addition, a rather ad-hoc set of editing rules for <CR> and <LF> had to be implemented for compatibility with local BB stations, so this interface is necessarily code sensitive.

In the case of IP datagrams, a full-bore IP-address/callsign dynamic mapping cache was implemented using two tables, the Channel Table and the Route Table. The Channel Table latches the current status (state and time-to-live (TTL) counter), last non-data message received and callsign. The callsign is used as the local-network address in the IP model. Following is an example (slightly edited) display captured during normal operation:

```
CID  Callsign Status   Message
-------------------------------------------------------------------------
0    W3HCF    0  0 5 fm W3IWI to KA3DBK via WB4JFI-5* ctl I17 pid F0
1    W4HCP       0  0 3 (1) DISCONNECTED fm W4HCP via WB4JFI-5
2                0  0 0
3    W3HCF    2  120   0 @PF0
4*               0  0 1 CHANNEL NOT CONNECTED
```

The CID field indicates the channel number, with the asterisk indicating the currently selected one, while the Status field is coded as first the state and then the TTL. The intent is that, if the TTL counts down to zero the channel is closed. The reason for this will be described momentarily. The Message field begins with the <code> field (codes 1-5 only) of the last message from the TAPR followed by the <text> field as-is. as received. A code of zero indicates the last message was a command sent to the TAPR. In the above, channel 2 has never been used.

The Route Table is maintained as a cache using mechanisms similar to the Address Resolution Protocol (ARP) used with Ethernets. It consists of an associative array of two-field entries, one field containing the IP address and the other the associated digipeater route. The table is presently handcrafted; however, plans are to dynamically manage the entries as the result of monitored channel activity, perhaps augmented by ARP-stype broadcasts. Obviously, this is where the fun lies in the protocol-development area. Following is an example display of the current version:

```
    IP address    Route
    ------------------------------
    [128.4.1.1]   W3HCF WB4JFI-5
    [128.4.1.2]   W4HCP WB4JFI-5
    [128.4.1.3]   WD5DBC WB4JFI-5
    [0.0.0.0] W3HCF WB4JFI-5
```

Note that the contents of the Route field can be used as-is as the argument in a TAPR connect command. In this particular case, the local radio channel is configured as subnet 128.4.1 of net 128.4, which is the swamp in which our own fuzzballs sleaze. Also note the default [0.0.0.0], which matches all other IP addresses, used for loopback and testing.

Connection Mode

The whole contraption can operate in either connection or connectionless mode. In connection mode it operates like this. Assume no channels are connected and a datagram originates at the fuzzball or arrives from another link destined for 128.4.1.2, previously determined to belong to W4HCP and to be reachable via the WB4JFI-5 digipeater. The Route Table is searched for 128.4.1.2 and yields the route string W4HCP WB4JFI-5. Next the Channel Table is searched for an active channel matching the destination callsign W4HCP in that string, keeping track of the highest-numbered inactive channel in the process and avoiding the monitor channel (0) and the currently selected ASCII channel (4 in the above display). If the match succeeds, the datagram is immediately sent on the associated channel; if not, a connection command specifying the route string is sent on the higest-numbered inactive channel and that channel is marked active. The datagram starting all this is sent following the command and is queued in the TAPR. Note that all datagrams are sent with protocol id CC (hex), which is assigned to the IP network layer in AX.25.

Datagrams arriving from the TAPR on an active channel are simply tossed into the normal fuzzball routing algortihm just as if they arrived from other links. A transmitted or received datagram causes the TTL field in the Channel Table entry to be reset to its maximum. The TTL fields of all active channels are decremented once in a while and, if one of them counts down to zero, a disconnect command is sent to the channel, allowing it to be used for possibly other destinations. Note that the AYT mechanism mentioned above is also operative and would normally catch a broken station before the TTL mechanism did. The TTL mechanism is intended primarily as a garbage collector when channels lie dormant for unreasonable periods.

Presumably as the result of monitoring activity, amendments are continuously being made to the Route Table. If a connection breaks with datagrams queued, the queue will be discarded and a new connection attempted according to the latest information in the Route Table. The lost datagrams will be recovered through the ordinary retransmission mechanisms of the client transport protocol. Obviously, the key to the success of this scenario lies in the ability to effectively collect the route information and maintain the Route Table. Further development is anticipated in this area.

Connectionless Mode

In connectionless mode all IP datagrams are sent and received on channel 0. This requires considerable heroics in separating the desired IP traffic from other traffic on the channel, not to mention monitoring headers and data. A datagram originating at the fuzzball or arriving from another link initiates the same operations as in the connection mode, as described above, except that channel 0 is used and it is never marked active. This implies some overhead, since a connection command is always sent preceeding every datagram. It is easy to avoid this by the simple expedient of saving the last argument and suppressing this if the argument is unchanged.

At present the only mechanism to capture IP datagrams from the radio channel is by turning on UI-frame monitoring (Ethernetters know this as promiscuous

mode) and carefully filtering IP datagrams from the general slosh. The Thursday-night implementation (which should be obsolete by the time you read this) is to toss everything at the IP-header validation routine, which verifies correct IP header format and checksum and with high probability chucks everything but IP datagrams on the floor.

Initial Experiments

The driver is built so that ordinary monitoring headers and data are sent to the system log file, which allows channel activity to be observed in real time, as well as captured for later analysis. During initial testing it was obvious that a fair number of other protocol implementations active in the local community are defective, inefficient or worse. A report on that will be presented at another time. Specific IP tests were conducted in connection and connectionless mode via the WB4JFI-5 digipeater, which is on a high tower and has a very strong signal in the W3HCF local area. It can then be assumed that almost all packet losses are in the direction from W3HCF to WB4JFI-5 and those due to collisions aggravated by the hidden-terminal problem.

Initial experiments used virtual-terminal (TELNET), file-transfer (FTP) and raw-datagram (ICMP Echo) protocols. In general, the tests were successful and demonstrated that the Internet protocols worked handily via the lashup. However, several problems were immediately apparent, among them:

1. The speed of the fuzzball-TAPR connecting line is only 1200 bps, so that nontrivial queuing delays due monitoring and status information place exceptional strain on the TCP retransmission-delay estimation algorithm. The result is an unneccessarily high incidence of TCP retransmissions. Obviously, the cure for this is to hop up the speed, which will have been done before you read this.

2. In connection mode when times get tough the TAPR tries heroically to get the traffic through, which may involve several minutes of retransmissions, resets, etc., during which TCP is retransmitting and possibly abandoning the connection. Even if the traffic does get through, the result is gobs of useless duplicates and end-end ACKs which clutter up the channel. The cure for this is to reduce the max-retransmission limits and short-circuit the reset procedure.

3. I have observed that, on average, between one packet in four and one packet in ten is lost on the local radio channel. This is a high loss rate even for TCP, which is designed for a more lossy environment even than HDLC, let alone AX.25. Casual inspection of the monitoring log shows inspired braindamage on the part of some local AX.25 implementations using excessively large window sizes, which lead to excessive retransmissions at such high loss rates. This problem has nothing intrinsically to do with IP or TCP and can be cured by judicious intervention by the Protocol Police.

Conclusions and Plans

The "Nagle Algorithm" in conjunction with other refinements developed for the fuzzball TCP implementation was designed specifically to minimize spurious packet traffic and in principal could result in much improved performance.

While the packetization and estimation algorithms designed for the present generation of TCP implementations have been designed for an extremely wide range in delays, speeds and loss rates, they have not been optimized for the extreme regime represented by a 1200-bps packet channel with loss rates in the neighborhood of one in four. The fuzzball TCP implementation, which has been designed and heavily instrumented for protocol development, is a useful tool to explore these issues.

From a purely engineering perspective the use of ARQ techniques in such a regime is flawed at best and should in any case be augmented by some form of FEC coding. In addition, the use of compression techniques (e.g. the SLIP protocol) should be explored as a mechanism to reduce packet-header overheads. Exploration of these issues may lead to revised packet formats and checksumming procedures. One of the first results expected to come out of this investigation is a requirement for separate checksums on the link-level header (AX.25 address, route and control bits) and data portions of the frame. The expectation is that residual "errors" alleged at the AX.25 level would be corrected by its client while nevertheless preserving the integrity of the routing and framing functions.

Probably the most effective realization of connectionless mode in the AX.25 paradigm would involve implementation of at least the IP-datagram support in the TAPR or equivalent. This is not really hard at all and amounts to adding a feature, keyed on the presence of CC in the protocol-id field together with a specific destination callsign, to indicate an IP message to the client host, which should be delivered with AX.25 header intact in order to support dynamic route cacheing as discussed previously. It should be possible to specify a list of such callsigns, which could then be used to implement a multicast/broadcast capability similar to Ethernets. This feature should be completely independent of the monitoring facility. Finally, it will be important in future to implement a filtering mechanism, based on the protocol-id field, which allows the casual user to avoid screen clutter due to unprintable code combinations while monitoring non-vanilla protocols.

Dave

From 4268519280732500626
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,99961133d0e556e7,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-18 18:19:11 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!decvax!genrad!mit-eddie!FAC0395%UOFT01.BITNET@WISCVM.ARPA
From: FAC0395%UOFT01.BITNET@WISCVM.ARPA
Newsgroups: net.ham-radio.packet
Subject: TNC's and Apples
Message-ID: <133@mit-eddie.UUCP>
Date: Fri, 18-Oct-85 21:19:11 EDT
Article-I.D.: mit-eddi.133
Posted: Fri Oct 18 21:19:11 1985

Date-Received: Tue, 22-Oct-85 07:30:22 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 7

From: FAC0395%UOFT01.BITNET@WISCVM.ARPA (Joe Feustle)
Does anyone have a TNC hooked up with an Apple IIe? What
software do I need to run on the IIe (AE-PRO)? Any
problems with cables from the Super Serial Card???
Help! Tnx.

N8AAT

From 9194886180584829484
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,a9966add9fa35d9e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-19 04:40:09 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!decvax!ucbvax!ucdavis!lll-crg!seismo!harvard!think!mit-eddie!
BEELER@USC-ISI.ARPA
From: BEELER@USC-ISI.ARPA
Newsgroups: net.ham-radio.packet
Subject: Add me to the list, pse
Message-ID: <134@mit-eddie.UUCP>
Date: Sat, 19-Oct-85 07:40:09 EDT
Article-I.D.: mit-eddi.134
Posted: Sat Oct 19 07:40:09 1985
Date-Received: Mon, 21-Oct-85 06:36:17 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 9

From: BEELER@USC-ISI.ARPA

Would you add a friend to the Packet Radio address list ??
He's WB2WVG, Don Maziarz. His ARPA mailbox is MAZIARZ@NOSC.

Thanks !
Dave
 Beeler, W3INB

From -1011953571266099465
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,fc165c8b9417a026,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-19 11:49:23 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP

Path: utzoo!linus!decvax!ucbvax!ucdavis!lll-crg!seismo!harvard!think!mit-eddie!
KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: Version 1.0 of WA8DED firmware for TAPR TNC-1
Message-ID: <138@mit-eddie.UUCP>
Date: Sat, 19-Oct-85 14:49:23 EDT
Article-I.D.: mit-eddi.138
Posted: Sat Oct 19 14:49:23 1985
Date-Received: Mon, 21-Oct-85 06:22:18 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 102

From: Bob Clements <clements@bbnccq.ARPA>
This message announces the posting of version 1.0 of the WA8DED firmware for the TAPR TNC-1. It is being posted on SIMTEL20 on the ARPANET. Some Usenet guru will have to carry on from there for the usenet folks.

Version 0.91 was posted there previously. Version 1.0 has a few additional features, mostly in the monitoring area, and a few bug fixes.

The new files are available from SIMTEL20 as:

Filename	Type	Bytes	CRC
Directory MICRO:<CPM.PACKET>			
TNCDED10.DOC.1	ASCII	34730	3A91H
TNCDED10.HEX.1	ASCII	46093	0F18H
TNCDED10.MSG.1	ASCII	4022	85C3H

This firmware runs on the TAPR TNC-1 and its clones, the AEA and the Heath HD-4040 TNCs. It is NOT an upgrade of the TAPR code. It is a completely new implementation of the AX.25 protocol, both the current version 2.0 and the older 1.x version supported by the normal TAPR code. It also supports up to four simultaneously open connections on one TNC. And it has a "host friendly" mode, which is intended to simplify the interfacing of the TNC to a Bulletin Board or other computer system. It has noticeably fewer protocol bugs than the TAPR code, and a much more informative Monitor mode.

The command interface is NOT the same as the TAPR TNC code. It is therefore not just an improvement for your TNC, but a complete change of the interface. So you might not want it if you (or your computer) are used to the standard interface.

The files being posted are: This message, TNCDED10.MSG; The documentation file, TNCDED10.DOC; and the binary of the code itself, in Intel Hex format, in TNCDED10.HEX.

The code occupies two 2764 EPROMs (actually about 1.2 EPROMs - plenty

of space left in the second one). The EPROMs reside at C000 and E000 of the TNC, sockets U11 and U12 respectively. If you need to manipulate this file with a CP/M DDT, remember to use an offset with the I command so that you don't overwrite your DDT, BDOS and BIOS. Put C000 through DFFF into the EPROM for U11, and put E000 through FFFF into the EPROM for U12.

The code and documentation are copyrighted 1985 by Ronald Raikes, WA8DED. They are submitted with his permission for non-commercial use by individual Radio Amateurs. All other rights reserved by Ronald Raikes.

The program is written in 6809 assembler. The source code is not being posted, but is available from Ron by sending him an 8" SSSD CP/M format disk in a reusable mailer with return postage. Enclose a letter agreeing to the above personal use restriction. To ease the load on Ron, I will also make copies under the same ground rules.

You can reach Ron by packet through the forwarding mailbox network. Address him as WA8DED @ KD6SQ. He is not on ARPANET or Usenet. His US mail address is:

> Ronald Raikes, WA8DED
> 9211 Pico Vista Road
> Downey, CA 90240

If you want to mail me a disk, as offered above, I'm good in the callbook.

73,
Bob, K1BC
ARPANET: clements@bbn
Usenet: {ihnp4, decvax, linus}!bbncca!clements
Amateur Packet Radio BBS net: K1BC @ K1BC, via W0RLI

[Political statement: Boycott the TNC-2 until a maintenance release of TNC-1 comes out!]

[Usual disclaimers and trademark notices]

The following message ported from the WA6OSA Packet Mailbox:

*** Message from WA6OSA to ALL entered Thursday 01-Aug-85 at 8:45 PM
*** Subject: ++NEW IMPROVED++ WA8DED FIRMWARE FEATURES

Version 0.9 of the WA8DED firmware for the TAPR TNC-1 compatables is now available. It is written in 6809 assembly language and is contained in two 2764 EPROMs. Some of its outstanding features are:

1. Up to four simultaneous connects (plus unproto).
2. Easy to read 'monitor' frame information in unproto mode.
3. Simple 'On Screen' Calibration.
4. Digipeats version 2 protocol.

5. Meaningful channel status display (separate status for each channel).
6. Supports modem baud rates up to 9600 baud.
7. New-Improved Host Mode (for computer interface).
8. Display of link state and number of free buffers.
9. XON-XOFF flow control
10.Auto-Unattended/Beacon Mode.

Version 1.0 should be available around the first of September and is
contained in two 2764 EPROMS. The W6IXU mailbox is currently using a
beta version 0.9 of the WA8DED firmware.

From 3392612894233697601
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,45cfd9f377b38a78,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-20 10:57:49 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!decvax!ucbvax!ucdavis!lll-crg!seismo!harvard!think!mit-eddie!bcn
From: bcn@mit-eddie.ARPA
Newsgroups: net.ham-radio.packet
Subject: Testing the mailing list
Message-ID: <151@mit-eddie.UUCP>
Date: Sun, 20-Oct-85 13:57:49 EDT
Article-I.D.: mit-eddi.151
Posted: Sun Oct 20 13:57:49 1985
Date-Received: Tue, 22-Oct-85 06:44:02 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 5

From: bcn (Clifford Neuman)
This is a test of the packet-radio mailing list.
Please ignore it.

    ~ Cliff

From 8105297434206818769
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,47cf8cda7a44572e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-21 16:47:06 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!
FAC1154%UOFT01.BITNET@WISCVM.ARPA
From: FAC1154%UOFT01.BITNET@WISCVM.ARPA
Newsgroups: net.ham-radio.packet
Subject: Addition to mailing list
Message-ID: <162@mit-eddie.UUCP>
Date: Mon, 21-Oct-85 19:47:06 EDT

Article-I.D.: mit-eddi.162
Posted: Mon Oct 21 19:47:06 1985
Date-Received: Wed, 23-Oct-85 07:48:15 EDT
Sender: bcn@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 9

From: FAC1154%UOFT01.BITNET@WISCVM.ARPA (James Apsey)
Please add me to your packet-radio subscribers list.

Thanks.

Cordial 73 to all the packeteers.

Jim Apsey, K8JA
The University of Toledo

From 5522335778769381851
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5b082900c8cb4cc4,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,5b082900c8cb4cc4,start
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1985-10-21 19:38:43 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site anasazi.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!hao!noao!terak!mot!anasazi!john
From: john@anasazi.UUCP (John Moore)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: HF Packet Questions(TAPR)
Message-ID: <315@anasazi.UUCP>
Date: Mon, 21-Oct-85 22:38:43 EDT
Article-I.D.: anasazi.315
Posted: Mon Oct 21 22:38:43 1985
Date-Received: Fri, 25-Oct-85 07:29:24 EDT
Reply-To: john@anasazi.UUCP (John Moore)
Organization: Anasazi, Phoenix Az.
Lines: 18
Keywords: HF Packet, TAPR
Xref: linus net.ham-radio:2820 net.ham-radio.packet:91

Having tinkered a bit with 2-meter packet, I am now interested in going HF.
However, a bit of information would be helpful to me:
(1) Does everyone on HF run 300bd? Is it 103 modem tones?
(2) What hacks do I need to make to my HD-4040 (Heath TAPR clone) in order
to set it up for HF.
(3) What are good HF frequencies to operate on? How about gateways, BBS'?

          Any information would be helpful.
          Facts are even more useful.

--
John Moore (NJ7E)
{decvax|ihnp4|hao}!noao!terak!anasazi!john
{hao!noao|decvax|ihnp4|seismo}!terak!anasazi!john
(602) 952-8205 (day or evening)
5302 E. Lafayette Blvd, Phoenix, Az, 85018 (home address)

From -8385764193979305799
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,fe2667089e858633,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,fe2667089e858633,start
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1985-10-21 19:47:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site anasazi.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!hao!noao!terak!mot!anasazi!john
From: john@anasazi.UUCP (John Moore)
Newsgroups: net.ham-radio.packet,net.ham-radio
Subject: Kantronix in Mexico - Help! + FLAME
Message-ID: <316@anasazi.UUCP>
Date: Mon, 21-Oct-85 22:47:00 EDT
Article-I.D.: anasazi.316
Posted: Mon Oct 21 22:47:00 1985
Date-Received: Fri, 25-Oct-85 07:29:40 EDT
Reply-To: john@anasazi.UUCP (John Moore NJ7E/XE1HDO)
Organization: Anasazi, Phoenix Az.
Lines: 28
Xref: linus net.ham-radio.packet:92 net.ham-radio:2821

During the Mexico City earthquake disaster, we tried to get a Kantronix packet interface going in Mexico City for health and welfare traffic. Unfortunately, during the short time we had to test it, we couldn't get it to receive anything. The manual was singularly uninformative about troubleshooting. It appears that the FSK work is all done by a magic chip which has no description in the book and a custom part number. We couldn't find any pin that appeared to have the FSK demodulator output.

Does anyone know how to tune this beast up with a scope, rather than just using the frequency counts? Does this thing work? Is it any good? Does anyone at Kantronix know how to write a technical manual?

+++FLAME ON+++
We wasted several hours of valuable disaster net time due to the sorrowful documentation on this product!
+++FLAME OFF+++

What should I tell Carlos (XE1HC)? Should he throw the thing away or is there a rational way to get it to work?

--
John Moore (NJ7E/XE1HDO)
{decvax|ihnp4|hao}!noao!terak!anasazi!john
{hao!noao|decvax|ihnp4|seismo}!terak!anasazi!john
(602) 952-8205 (day or evening)
5302 E. Lafayette Blvd, Phoenix, Az, 85018 (home address)

From 1523878255216356105
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,c648ca8c06ec47d0,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-22 06:14:52 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!HOFFMANN@MIT-MARIE
From: HOFFMANN@MIT-MARIE
Newsgroups: net.ham-radio.packet
Subject: PCS 2000 tuning problem
Message-ID: <169@mit-eddie.UUCP>
Date: Tue, 22-Oct-85 09:14:52 EDT
Article-I.D.: mit-eddi.169
Posted: Tue Oct 22 09:14:52 1985
Date-Received: Thu, 24-Oct-85 05:54:18 EDT
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 23

From: Ron M. Hoffmann <hoffmann%marie@mit-mc.mit.edu>
Speaking of Azden PCS 2000s; (I know, you'd rather not)
I discovered a peculiar problem with mine that I'd like
help in tracing down.

A couple of weeks ago when the meteor-scatter packet-radio
experiment was proposed during the Giacobini Zinner (sp?)
pass-by I tried to set my station up on 145.09 to participate.
I noticed a large amount of activity on the channel. Closer
monitoring revealed that I was in fact still on 145.01.

I switched back and forth several times to verify this and
found it to be, sadly, the truth. I have never noticed any
other abnormalities in the tuning of the rig and don't know,
offhand, how to ferret out the problem. Anybody have any
suggestions?

73 de Ron, WA2EYC

PS: Sorry if you get this twice but I have posted it to both
    Info-hams and Packet-radio. rmh-eyc

From -5292314337098141249
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,a3ce1cb485802d77,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-23 08:51:38 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site watmath.UUCP
Path: utzoo!watmath!wmbabineau
From: wmbabineau@watmath.UUCP (W. Michael Babineau)
Newsgroups: net.ham-radio.packet
Subject: How do X.25 and AX.25 differ??
Message-ID: <16961@watmath.UUCP>
Date: Wed, 23-Oct-85 11:51:38 EDT
Article-I.D.: watmath.16961
Posted: Wed Oct 23 11:51:38 1985
Date-Received: Thu, 24-Oct-85 01:19:36 EDT
Distribution: net
Organization: U of Waterloo, Ontario
Lines: 23

I am a new subscriber to this group and I am not completely familliar
with the lingo/terminology of amateur packet radio, yet.
I would appreciate it if someone could tell me what the differences are
between the X.25 we all know and love and AX.25 which is frequently mentioned
in this group. Please e-mail your response to me.

Thanks in advance,

Michael VE1BXR/VE3

--

W. Michael Babineau
Multiprocessor Systems Group,
Dept. of Computer Science,
University of Waterloo.

USENET: {ihnp4,allegra,decvax,utzoo,utcsri}!watmsg!wmbabineau
!watmath!wmbabineau

From -4581155047476414500
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,5b082900c8cb4cc4
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-24 21:35:39 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!KPETERSEN@SIMTEL20.ARPA

From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: HF Packet Questions(TAPR)
Message-ID: <192@mit-eddie.UUCP>
Date: Thu, 24-Oct-85 23:35:39 EST
Article-I.D.: mit-eddi.192
Posted: Thu Oct 24 23:35:39 1985
Date-Received: Thu, 31-Oct-85 05:28:02 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 19

From: John Moore <john%anasazi.uucp@BRL.ARPA>
Having tinkered a bit with 2-meter packet, I am now interested in
going HF. However, a bit of information would be helpful to me:

(1) Does everyone on HF run 300bd? Is it 103 modem tones?

(2) What hacks do I need to make to my HD-4040 (Heath TAPR clone) in
order to set it up for HF.

(3) What are good HF frequencies to operate on? How about gateways, BBS'?

         Any information would be helpful.
         Facts are even more useful.
--
John Moore (NJ7E)
{decvax|ihnp4|hao}!noao!terak!anasazi!john
{hao!noao|decvax|ihnp4|seismo}!terak!anasazi!john
(602) 952-8205 (day or evening)
5302 E. Lafayette Blvd, Phoenix, Az, 85018 (home address)

From 8058738157616635241
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,fe2667089e858633
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-24 21:37:52 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: Kantronix in Mexico - Help! + FLAME
Message-ID: <193@mit-eddie.UUCP>
Date: Thu, 24-Oct-85 23:37:52 EST
Article-I.D.: mit-eddi.193
Posted: Thu Oct 24 23:37:52 1985
Date-Received: Thu, 31-Oct-85 05:28:41 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 27

From: John Moore <john%anasazi.uucp@BRL.ARPA>
During the Mexico City earthquake disaster, we tried to get a
Kantronix packet interface going in Mexico City for health and welfare
traffic. Unfortunately, during the short time we had to test it, we
couldn't get it to receive anything. The manual was singularly
uninformative about troubleshooting. It appears that the FSK work is
all done by a magic chip which has no description in the book and a
custom part number. We couldn't find any pin that appeared to have the
FSK demodulator output.

Does anyone know how to tune this beast up with a scope, rather than
just using the frequency counts? Does this thing work? Is it any good?
Does anyone at Kantronix know how to write a technical manual?

+++FLAME ON+++
We wasted several hours of valuable disaster net time due to the
sorrowful documentation on this product!
+++FLAME OFF+++

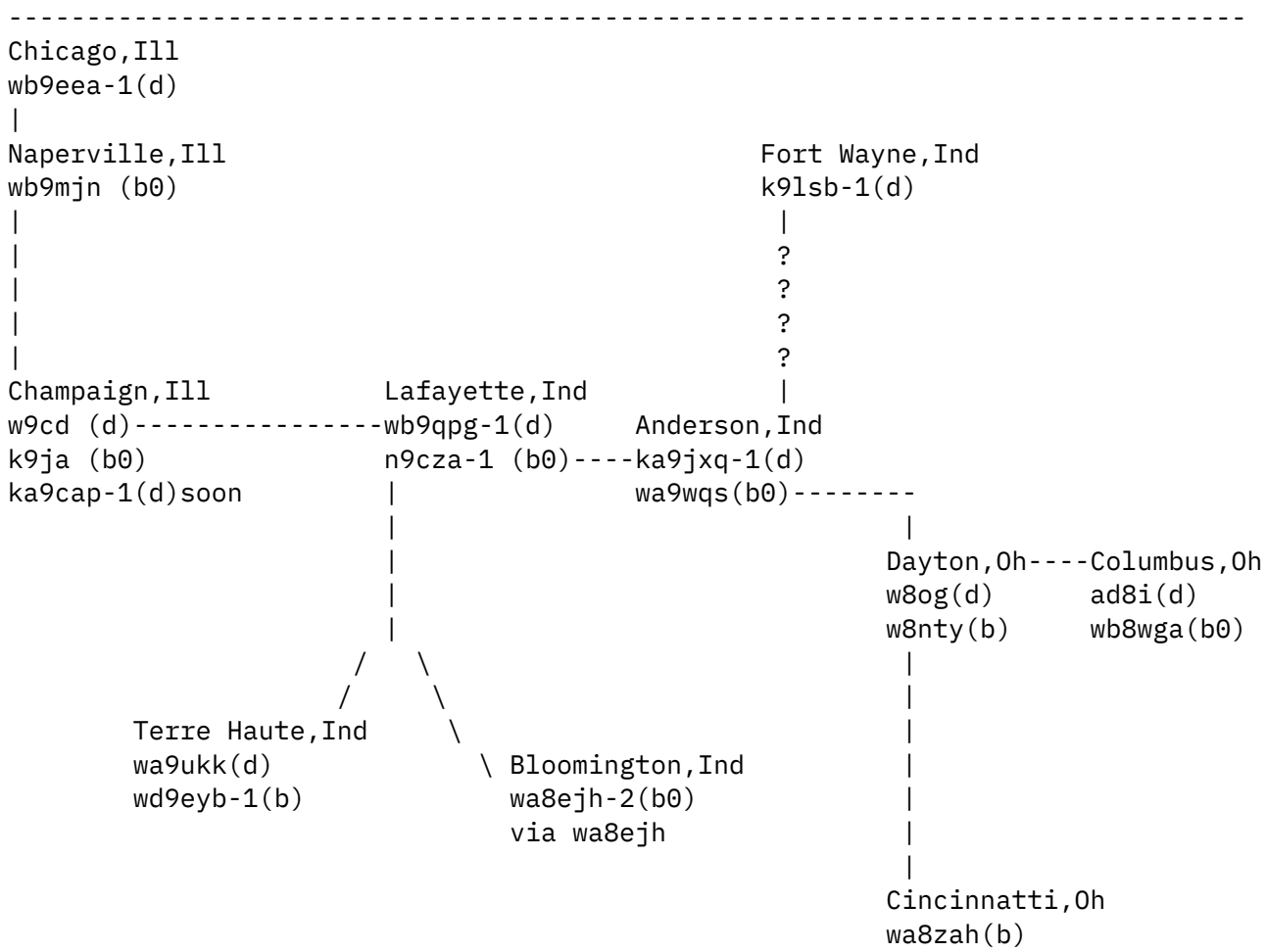
What should I tell Carlos (XE1HC)? Should he throw the thing away or
is there a rational way to get it to work?
--
John Moore (NJ7E/XE1HDO)
{decvax|ihnp4|hao}!noao!terak!anasazi!john
{hao!noao|decvax|ihnp4|seismo}!terak!anasazi!john
(602) 952-8205 (day or evening)
5302 E. Lafayette Blvd, Phoenix, Az, 85018 (home address)

From 5189544063949795744
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,8b930fbf1714ad93,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-25 21:34:20 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!KPETERSEN@SIMTEL20.ARPA
From: KPETERSEN@SIMTEL20.ARPA
Newsgroups: net.ham-radio.packet
Subject: Packet radio map for Michigan needed
Message-ID: <208@mit-eddie.UUCP>
Date: Fri, 25-Oct-85 23:34:20 EST
Article-I.D.: mit-eddi.208
Posted: Fri Oct 25 23:34:20 1985
Date-Received: Thu, 31-Oct-85 04:44:55 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 43

From: Jeffrey Shields <pur-ee!shields@seismo.CSS.GOV>
I am interested in obtaining a recent packet radio map for the state
of Michigan. Do you have such an animal or know where I might find
one? For now I am mainly interested in any digipeaters/bulletin board

systems. We have a network of digipeaters/bbs's here in Indiana area
and are looking for links north on 145.01 Mhz. Here's what we have so
far. Thanks and 73's.

Jeff Shields N9CZA (pur-ee!shields)



(d) ... digipeater
(b0) ... W0RLI BBS
(b) ... other BBS

From 2993573019387907151
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,3fad61823f4f98b5,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-25 23:14:55 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!
FAC0392%UOFT01.BITNET@WISCVM.ARPA
From: FAC0392%UOFT01.BITNET@WISCVM.ARPA
Newsgroups: net.ham-radio.packet
Subject: Please help

Message-ID: <209@mit-eddie.UUCP>
Date: Sat, 26-Oct-85 01:14:55 EST
Article-I.D.: mit-eddi.209
Posted: Sat Oct 26 01:14:55 1985
Date-Received: Thu, 31-Oct-85 04:53:25 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 11

From: FAC0392%UOFT01.BITNET@WISCVM.ARPA (Len Brady)
I have ordered a TAPR TNC-2 but I realize now that I don't know
what it will take to run it with my Apple //e. Can anyone share
knowledge, experience, etc? Do I need to buy a serial card? Will
the TNC hook up parallel somehow?

Panic is setting in. Please send advice.

73

Len KF8J   <FAC0392@UOFT01.BITNET>

From -5982513554023721429
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,384a62a84a49b2c3,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 150311,d55785c17a1a7dca
X-Google-Attributes: gid150311,public
X-Google-ArrivalTime: 1985-10-29 12:34:11 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10 5/3/83; site ius2.cs.cmu.edu
Path: utzoo!linus!philabs!cmcl2!seismo!rochester!pt.cs.cmu.edu!ius2.cs.cmu.edu!
ralphw
From: ralphw@ius2.cs.cmu.edu (Ralph Hyre)
Newsgroups: net.micro.6809,net.ham-radio.packet
Subject: Would os-9 and packet be a winning combination?
Message-ID: <223@ius2.cs.cmu.edu>
Date: Tue, 29-Oct-85 15:34:11 EST
Article-I.D.: ius2.223
Posted: Tue Oct 29 15:34:11 1985
Date-Received: Thu, 31-Oct-85 09:23:42 EST
References: <835@lsuc.UUCP> <???@eddie.UUCP>
Distribution: net
Organization: Carnegie-Mellon University, CS/RI
Lines: 29
Keywords: packet, os9
Xref: linus net.micro.6809:548 net.ham-radio.packet:98

I've collected five pieces of information in the past few months that
seem to indicate this is so.

I've read on the net that some people in Hamburg are working on a 'eurocard'
TNC, and that another company in the US makes a 'eurocard' 6809 system that

can run OS-9. I've also heard that the TAPR TNC-1 is 6809 based, and that a amateur radio operator in the Pittsburgh area is doing packet on his Color Computer (another 6809 based machine) by hooking up FSK chips to I/O channels.

Why would the 6809 be better than, say a z-80? Would the fact that good implementations of multasking OSes (like OS-9) are available for it? (This would seem to make software which supports multiple connections easier to write.) Or is the Z-80 the preferred processor for packet, simply because of cost?

--
- Ralph
Internet: ralphw@c.cs.cmu.edu (cmu-cs-c.arpa)
Usenet: ralphw@mit-eddie.uucp
Fidonet: Ralph Hyre at Fido #385 Pitt-Bull (or maybe Net 129, node 0)
Snail Mail: don't bother

--
- Ralph
Internet: ralphw@c.cs.cmu.edu (cmu-cs-c.arpa)
Usenet: ralphw@mit-eddie.uucp
Fidonet: Ralph Hyre at Fido #385 Pitt-Bull (or maybe Net 129, node 0)
Snail Mail: don't bother

From 2324568045905290871
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,da594528c4db1a3e,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-30 10:09:31 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!clements@bbnccq
From: clements@bbnccq
Newsgroups: net.ham-radio.packet
Subject: Q Street on TNCs
Message-ID: <253@mit-eddie.UUCP>
Date: Wed, 30-Oct-85 13:09:31 EST
Article-I.D.: mit-eddi.253
Posted: Wed Oct 30 13:09:31 1985
Date-Received: Sun, 3-Nov-85 07:20:00 EST
Sender: nessus@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 40

From: Bob Clements <clements@bbnccq.ARPA>
Fellow Packeteers:

Two comments on the article in the new QST on the TAPR, Heath and AEA TNCs...

1) The article says, approximately, that the TAPR code implements

the ARRL-blessed AX.25 (Service mark pending!) protocol. And that it implements it correctly and has no bugs.

Comment: AAAAAAAARRRRRRRRRGGGHGHHHH!!!!! Yuck! Such lies!!!! It implements only version 1 of the protocol, not the current V2.0. And it has bugs all over the place, particularly under any congestion. I am furious at TAPR for not getting out their maintenance release in literally years. I refuse to even consider a TNC-2 for this reason.

ARRL continues to write only glowing reviews of anything at all. I continue to have no faith in their reviews.

Yuck! Yuck!!! Ptooey!!!!!!

and now that I have that out of my system....

2) QST says the AEA has fixed the design bug that caused NOVRAM to fail so much on TAPR TNCs. I have never seen any real claim as to what needs to be done to fix it. Early rumors involved the clock oscillator running at the wrong speed sometimes, which it did, but that is NOT the thing (or the only thing) killing the NOVRAM. Does anyone know what AEA did about the NOVRAM? Packeterm uses a lithium battery and static RAM, but maintains software compatibility. Heath added a feedback loop in the reset circuit to get a longer reset pulse, which may or may not be the reason my HD4040 NOVRAM works better than the ones in my two TAPR TNC-1s. But I don't know anything about the AEA circuit.

73,

Bob, K1BC

From -7090422310668056758
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,da8d4dc74db0b39b,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-30 10:31:07 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84 exptools; site ihlpg.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!ihlpg!retzner
From: retzner@ihlpg.UUCP (Retzner)
Newsgroups: net.ham-radio.packet
Subject: Hello World?
Message-ID: <1390@ihlpg.UUCP>
Date: Wed, 30-Oct-85 13:31:07 EST
Article-I.D.: ihlpg.1390
Posted: Wed Oct 30 13:31:07 1985
Date-Received: Sat, 2-Nov-85 02:41:44 EST
Distribution: na
Organization: AT&T Bell Laboratories

Lines: 5

This news group has been quiet lately.
Or is something messed up again?

Bill Retzner
ihnp4!ihlpg!retzner

From 6765902336083468896
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,da594528c4db1a3e
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-30 12:19:45 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!ron@BRL.ARPA
From: ron@BRL.ARPA
Newsgroups: net.ham-radio.packet
Subject: Re: Q Street on TNCs
Message-ID: <254@mit-eddie.UUCP>
Date: Wed, 30-Oct-85 15:19:45 EST
Article-I.D.: mit-eddi.254
Posted: Wed Oct 30 15:19:45 1985
Date-Received: Sun, 3-Nov-85 07:20:20 EST
Sender: nessus@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 6

From: Ron Natalie <ron@BRL.ARPA>
I stopped reading QST several years ago when they published
the article on how to implement a touch-tone decoder using
24 phase locked loops.

-Ron

From 7057357758044293063
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f3f8f9b715627c54,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-30 15:27:57 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site sphinx.UChicago.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!gargoyle!sphinx!supp
From: supp@sphinx.UChicago.UUCP (Steve Upp)
Newsgroups: net.ham-radio.packet
Subject: General questions on packet
Message-ID: <1260@sphinx.UChicago.UUCP>
Date: Wed, 30-Oct-85 18:27:57 EST
Article-I.D.: sphinx.1260
Posted: Wed Oct 30 18:27:57 1985
Date-Received: Sat, 2-Nov-85 01:49:43 EST

Organization: U. Chicago - Computation Center
Lines: 45

>This news group has been quiet lately.
>Or is something messed up again?
>
>Bill Retzner
>ihnp4!ihlpg!retzner

  Well maybe these questions can re-awaken a temporarily sleeping group.

I have a few questions regarding the current state of packet radio.

    1) Where can I get lots of information about it? The only
          documentation I have so far is the November CQ magazine.

    2) What is the maximum size of an AX.25 packet?

    3) What plans are there for the next level of network software
          to be add to the basic network layer of error checking
          packet communications that has been provided by AX.25.

    4) Why has the FCC limited H.F. data transmission rates to 300
              baud? I'm aware of the the limits on 2 meters and above.

    5) I'm particularly intersted in H.F. (D.X.) packet radio. How
          much success has been made on the long distance bands?
          I'm aware of the digirepeater capabilities of most of the
          packet boxes, however I'm thinking more of long distance
          point to point transmission because of the sacrificed speed
          that digirepeating inherently requires.

Forgive my ignorance if I have made obvious blunders in the statements above
I've only recently started looking into packet radio.

From the few articles I've seen in CQ, this could be very interesting.

One last thing-I'm not a licensed ham--------yet.

Thanks in advance

Steve Upp
  ...!ihnp4!gargoyle!sphinx!supp

From 8404965351589778945
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,e8111cf297721a7f,start

X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-30 17:57:10 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!@DCN7.ARPA:mills@dcn6.arpa
From: @DCN7.ARPA:mills@dcn6.arpa
Newsgroups: net.ham-radio.packet
Subject: The Wiretap Algorithm (*long*)
Message-ID: <257@mit-eddie.UUCP>
Date: Wed, 30-Oct-85 20:57:10 EST
Article-I.D.: mit-eddi.257
Posted: Wed Oct 30 20:57:10 1985
Date-Received: Sun, 3-Nov-85 07:40:20 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 622

From: mills@dcn6.arpa
Folks,

I hope you enjoy the following enough that you won't get mad at me for bloating your mail file, which as we all know creates gas.

Dave

The Wiretap Algorithm

Abstract

This document introduces wiretap algorithms, which are a class of routing algorithms that compute quasi-optimal routes for stations sharing a broadcast channel, but with some stations hidden from others. The wiretapper observes the paths (source routes) used by other stations sending traffic on the channel and, using a heuristic set of factors and weights, constructs speculative paths for its own traffic. A prototype algorithm, called here the Wiretap Algorithm, has been designed for the AX.25 packet-radio channel. Its design is similar in many respects to the shortest-path-first (spf) algorithm used in the ARPANET and elsewhere, and is in fact a variation on the Viterbi algorithm in that it constructs minimum-weight paths as a function of a weighted sum of factors derived from link and node quality estimates.

Since the amateur AX.25 packet-radio channel is very active in the Washington, DC, area and carries a good deal of traffic under punishing conditions, it was considered a sufficiently fiesty environment to implement and test the prototype algorithm. It was implemented as part of an IP/TCP driver for the LSI-11 processor running the "fuzzball" operating system. The driver is connected via serial line to a 6809-based TAPR-1 processor running the WA8DED firmware. This document describes the design, implementation and initial testing of the algorithm.

Introduction

This document describes the design, implementation and initial testing of the

Wiretap Algorithm, a dynamic routing algorithm for the AX.25 packet-radio channel. The AX.25 channel operates in CSMA contention mode at VHF frequencies using AFSK/FM modulation at 1200 bps. The AX.25 protocol itself is similar to X.25 LAPB, but with an extended frame header consisting of a string of radio callsigns representing a path, usually selected by the operator, from the originating station to the destination station, possibly via one or more intermediate packet repeaters or digipeaters. Most stations can operate simultaneously as digipeaters and as end systems.

Wiretap uses passive monitoring of frames transmitted on the channel in order to build a dynamic data base which can be used to determine optimum routes. The algorithm operates in real time and selects a minimum-weight path, as determined by a shortest-path-first procedure similar to that used now in the ARPANET and planned for use in the new Internet gateway system. The implementation provides optimum routes (with respect to the factors and weights selected) at initial-connection time for virtual circuits, as well as for each datagram transmission. This note is an initial status report and overview of the prototype implementation for the LSI-11 processor running the "fuzzball" operating system.

The principal advantage in the use of routing algorithms like Wiretap is that digipeater paths can be avoided when direct paths are available, with digipeaters used only when necessary and also to discover hidden stations. In the present exploratory stage of evolution, the scope of Wiretap has been intentionally restricted to passive monitoring. In a later stage the scope may be extended to include the use of active probes to discover hidden stations and the use of clustering techniques to manage the distribution of large quantities of routing information.

The AX.25 channel interface is the 6809-based TAPR-1 processor running the WA8DED firmware (version 1.0) and connected to the LSI-11 by a 4800-bps serial line. The WA8DED firmware produces as an option a monitor report for each received frame of a selected type, including U, I and S frames. Wiretap processes each of these to extract routing information and (optionally) saves them in the system log file. Following is a typical report:

```
fm KS3Q to W4CQI via WB4JFI-5* WB4APR-6 ctl I11 pid F0
```

The originating station is KS3Q and the destination is W4CQI. The frame has been digipeated first by WB4JFI-5 and then WB4APR-6, is an I frame (sequence numbers follow the I indicator) and has protocol identifier F0 (hex). The asterisk "*" indicates the report was received from that station. If no asterisk appears, the report was received from the originator.

Design Principles

A path is a concatenation of directed links originating at one station, extending through one or more digipeaters and terminating at another station. Each link is characterized by a set of factors such as cost, delay or throughput that can be computed or estimated. Wiretap computes several intrinsic factors for each link and updates the routing data base, consisting of node and link tables. The weighted sum of these factors over the entire path is the path weight.

Wiretap incorporates an algorithm which constructs the minimum-weight paths between given end stations according to the factors and weights contained in the routing data base. Such paths can be considered optimum routes between these stations with respect to the given assignment of factors and weights. In the prototype implementation one of the end stations must be the Wiretap station itself.

Note that Wiretap in effect constructs minimum-weight paths in the direction from another station to the Wiretap station and, based on that information, then computes the optimum reciprocal routes from the Wiretap station to the other station. The expectation is that the other station also runs its own routing algorithm, which then computes its own optimal reciprocal routes (i.e. the optimum direct routes from the Wiretap station). However, the routing data bases at the two stations may diverge due to congestion or hidden stations, so that the computed routes may not coincide.

In principle, Wiretap-computed routes can be fine-tuned using information provided not only by its directly communicating stations but others that may hear them as well. The best scenario would be for all stations to exchange Wiretap information using a suitable distributed protocol, but this is at the moment beyond the scope of the prototype implementation. Nevertheless, suboptimal but useful paths can be obtained in the traditional and simple way with one station using a Wiretap-computed route and the other its reciprocal, as determined from the received frame header. Thus, Wiretap is compatible with existing channel procedures and protocols.

Implementation Overview

The prototype Wiretap implementation for the LSI-11 includes two routines, the wiretap routine, which extracts information from received monitor headers and builds the routing data base, and the routing routine, which calculates routes using the information in the data base. The data base consists of three tables, the channel table, node table and link table. The channel table includes an entry for each channel of the TAPR-1 processor running the WA8DED firmware, five in the present configuration. The structure and use of this table are only incidental to the algorithm and will not be discussed further.

The node table includes an entry for each distinct callsign (which may be a collective or beacon identifier) heard on the channel, together with its assigned IP address (if known), node-related routing information, the latest computed route and other miscellaneous information. The table is indexed by node ID (NID), which is used in the computed route and in other tables instead of the awkward callsign string.

The link table contains an entry for each distinct (unordered) node pair observed in a monitor header. Each entry includes the from-NID and to-NID of the first instance found, together with node-related routing information and other miscellaneous information.

The example discussed later in this document includes candidate node and link tables for illustration. These tables were constructed in real time by the prototype implementation from off-the-air monitor headers collected over a

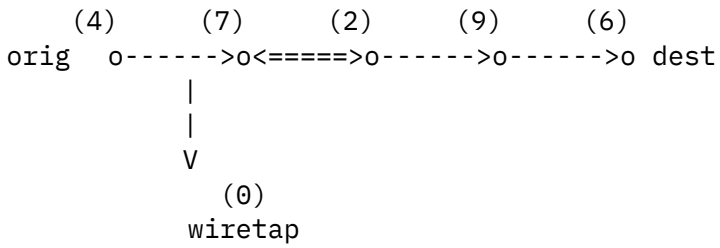
several-hour period on a busy evening. Each node table entry requires 30 bytes and each link table entry four bytes. The maximum size of the node table is presently 100 entries, while that of the link table is 300 entries. The data base illustrated in the example has 42 entries in the node table and 46 entries in the link table.

The node table and link table together contain all the information necessary to construct a network graph, as well as calculate the shortest path on that graph between any two end stations, not just those involving the Wiretap station. Note, however, that the Wiretap station does not in general hear all other stations on the channel, so may choose suboptimal routes. In practice in the Washington, DC, area, most stations use a digipeater, which is in general heard reliably by other stations in the area. Thus, a Wiretap station can eventually capture routes to almost all other stations using the above tables and the routing algorithm described later.

The Wiretap Routine

The wiretap routine is called to process each monitor header. It extracts each callsign from the header in turn and searches the node table for corresponding NID, making a new entry and NID if not already there. The result is a string of NIDs, starting at the originating station, extending through a maximum of eight digipeaters, and ending at the destination station. For each pair of NIDs along this string the link table is searched for either the direct link, as indicated in the string, or its reciprocal; that is, the direction towards the originator.

The operations that occur at this point can be illustrated by the following diagram, which represents a monitor header with apparent path from station 4 to station 6 via digipeaters 7, 2 and 9 in sequence. It happens the header was heard by the Wiretap station (0) from station 2.



Presumably, the fact that the header was heard from station 2 indicates the path from station 4 to station 2 and then to station 0 is viable, so that each link along this path can be marked "heard" in that direction. However, the viability of the path from station 2 to station 6 can only be presumed, unless additional evidence is available. If in fact the header is from an I or S frame (but not a U frame), an AX.25 virtual circuit has apparently been previously established between the end stations and the presumption is strengthened. In this case each link from 4 to 6 is marked "synchronized" (but not the link from 2 to 0).

Depending on the presence of congestion and hidden stations, it may happen that the reciprocal path in the direction from station 6 to station 4 has quite different link characteristics; therefore, a link can be marked heard in

each direction independently. In the above diagram the link between 2 and 7 is marked heard in both directions. However, there is only one synchronized mark, which can be set in either direction. If a particular link is not marked either heard or synchronized, any presumption on its viability to carry traffic is highly speculative (the frame is probably a beacon). If later marked synchronized the presumption is strengthened and if later marked heard in the reciprocal direction the presumption is confirmed.

Experience shows that a successful routing algorithm for the packet-radio channel must have provisions for congestion avoidance. There are two straightforward ways to cope with this. The first is a static measure of node congestion based on the number of links in the network graph incident at each node. This number is computed by the wiretap routine and stored in the node table as it adds entries to the link table.

The second, not yet implemented, is a dynamic measure of node congestion which tallies the number of link references during the most recent time interval (of specified length). The current plan was suggested by the reachability mechanism used in the ARPANET and the Exterior Gateway Protocol. An eight-bit shift register for each node is shifted in the direction from high-order to low-order bits, with zero-bits preceeding the high-order bit, at the rate of one shift every ten seconds. If during the preceeding ten-second period a header with a path involving that node is found, the high-order bit of the register is set to one. When a path is calculated the number of one-bits in the register is totalled and used as a measure of dynamic node congestion. Thus, the time interval specified is 80 seconds, which is believed appropriate for the AX.25 channel dynamics.

Factors and Weights

The data items produced by the wiretap routine are processed to produce a set of factors that can be used by the routing routine to develop optimal routes. In order to insure a stable and reliable convergence as the routing algorithm constructs and discards candidate paths leading to these routes, the factor computations should have the following properties:

1. All factors should be positive, monotone functions which increase in value as system performance degrades from optimal.

1. The criteria used to estimate link factors should be symmetric; that is, their values should not depend on the particular direction the link is used.

2. The criteria used to estimate node factors should not depend on the particular links that traffic enters or leaves the node.

Each factor is associated with a weight assignment which reflects the importance of the factor in the total path calculation, with the larger values indicating greater importance. The weighted sum of factors is thus a metric and represents the quantity to be minimized in the routing computation. Obviously, the success of this method depends on cleverly (i.e. experimentally) determined factor computations and weight assignments.

The particular choices used in the prototype implementation should be considered educated first guesses that might be changed, perhaps in dramatic ways, in later implementations. Nevertheless, the operation of the algorithm in finding optimum routes over all choices in factor computations and weights is unchanged. Recall that the wiretap routine generates data items for each node and link heard and saves them in the node and link tables. These items are processed by the routing routine to generate the factors shown below in Table 1 and Table 2.

Factor	Weight	Name	How Determined
f0	30	hop	1 for each link
f1	15	unverified	1 if not heard in either direction
f2	5	non-reciprocal	1 if not heard in both directions
f3	5	unsynchronized	1 if no I or S frame

Table 1. Link Factors

Factor	Weight	Name	How Determined
f4	5	complexity	1 for each incident link
f5	5	congestion	(see text)

Table 2. Node Factors

With regard to link factors, the "hop" factor is assigned as one for each link and represents the bias found in other routing algorithms of this type. The intent is that the routing mechanism degenerate to minimum-hop in the absence of any other information. The "unverified" factor is assigned as one if the heard bit is not set for either direction and zero otherwise, while the "non-reciprocal" factor is assigned as one if the heard bit is not set for both directions. The "unsynchronized" factor is assigned as one if the synchronized bit is not set (no I or S frames observed in either direction).

With regard to node factors, the "complexity" factor is computed as the number of links heard on the direction to the node, while the "congestion" factor (not yet implemented) is to be computed as the number of intervals in the eight ten-second intervals preceding the time of observation in which a frame was transmitted to or through the node. For the purposes of path-weight calculations, both of these factors are taken as zero for the endpoint nodes, since their contribution to any path would be the same.

The Routing Routine

The dynamic data base built by the wiretap routine is used by the routing routine to compute routes as required. Ordinarily, this needs to be done only when the first frame to a new destination is sent and at intervals thereafter, with the intervals perhaps modulated by retry count together with congestion thresholds, etc. The technique used is a variation of the shortest-path-first algorithm used in the ARPANET and elsewhere. It operates by constructing a set of candidate paths on the network graph, each assigned the weighted sum of the node and link factors along the path. Construction continues until all of the minimum-weight complete paths are found (each of the same minimum weight),

which are the optimum routes.

There are a number of algorithms to determine the mimimum-weight path on a graph between two nodes with given metric. The prototype implementation operates using a dynamic list of entries derived from the link table. Each list entry includes the from-NID and to-NID of a link in the path, along with the current accumulated path weight from the from-NID to the final destination NID of the path.

The algorithm starts with an empty list and the final destination NID. It scans the link table for all links with either to-NID or from-NID matching the final destination NID, updates the path weights based on the link factors and node factors of the to-NIDs and adds them to the list. Next, the algorithm selects the first entry in the list and scans the node table again for all links with from-NID matching the to-NID of this entry, updating the path weights as it proceeds. The algorithm coontinues to select succeeding entries and scan the link table until no further entries remain to be processed. In order to prevent a size explosion in the list, duplicates are suppressed along with potential loops (new entries with a from-NID matching the to-NID of an existing entry).

If the Wiretap station NID is found in the from-NID of a link to be added to the list a complete path has been found. The algorithm remembers the minimum path weight of all complete paths found as it proceeds. If the accumulated path weight found on any subsequent path exceeds this, the path is abandoned and no further list entries made for it. At the completion of processing the minimum-weight complete paths have been determined with the first one found identified as the optimum route. However, the path must be reversed, since it was constructed backwards starting at the destination. At the same time the callsigns can be extracted from the node table to build the TAPR-1 command line.

Some idea of the time and space complexity of the routing routine can be determined from the observation that the example below with 42 nodes and 46 links requires 27 list entries, each of which requires a scan of up to 46 links and a search (for duplicates and loops) of up to 27 list entries, and is thus roughly linear in the number of links and quadratic in the number of hops. The number of links is roughly somewhere between linear and quadratic in the number of nodes, so that processing resources can become strained if the number of nodes grows very large. The prototype implementation requires about 283 milliseconds on an LSI-11/73 to calculate the routes to all 42 nodes.

An Example

An example will illustrate how Wiretap constructs optimum routes given candidate node and link tables. The candidate tables resulted from a scenario monitoring normal traffic on the 145.01-MHz AX.25 packet-radio channel in the Washington, DC, area on a weekend evening. The node and link tables illustrated below give an idea of what the constructed data base looks like, as well as provide the basis for the example.

Figure 1 illustrates a candidate node table showing the node ID (NID), callsign and related information for each node in the order collected. The

Route field contains the digipeater route, as a string of NIDs, on a minimum-weight path to that station, except for the last one, which is the station NID itself. The absence of a route string indicates the station is directly reachable without the assistance of a digipeater. The Wgt field shows the total path weight of the route string shown, while the Links field contains the complexity factor f5. The contents of the remaining fields can be ignored. Note that the first four entries of the table are wired; that is, they were initialized with defaults before Wiretap was started.

NID	Callsign	IP Address	Flags	Links	Last Rec	Wgt	Route
0	W3HCF	[128.4.1.1]	000	14	00:00:00	0	1
1	WB4JFI-5	[128.4.1.2]	006	15	16:37:56	40	
2	W4HCP	[128.4.1.3]	000	0	00:00:00	0	1
3	WD5DBC	[128.4.1.4]	000	0	00:00:00	0	1
4	DPTRID	[0.0.0.0]	000	1	00:00:00	155	1
5	K4KMC	[0.0.0.0]	007	0	14:46:39	40	
6	WD4BAV	[0.0.0.0]	000	1	00:00:00	115	5 7
7	K4ARO-1	[0.0.0.0]	006	1	14:46:39	75	5
8	WB2RVX	[0.0.0.0]	007	3	16:25:42	85	18
9	W3IWI	[0.0.0.0]	007	6	16:37:44	40	
10	WB4APR-6	[0.0.0.0]	007	9	16:25:45	40	
11	KB5ZU	[0.0.0.0]	000	1	00:00:00	170	1
12	WB6RQN	[0.0.0.0]	003	0	16:33:17	40	
13	BEACON	[0.0.0.0]	000	3	00:00:00	80	16
14	KA4USE-1	[0.0.0.0]	007	8	15:57:59	40	
15	MAIL	[0.0.0.0]	000	1	00:00:00	125	10
16	WA4TSC	[0.0.0.0]	003	0	15:21:45	40	
17	CQ	[0.0.0.0]	000	1	00:00:00	80	5
18	KS3Q	[0.0.0.0]	007	2	16:25:47	40	
19	WB2MNF	[0.0.0.0]	006	2	15:05:05	120	10
20	KC2TN	[0.0.0.0]	007	3	15:05:05	85	18
21	AK3P	[0.0.0.0]	007	1	14:00:07	130	24 22
22	AK3P-5	[0.0.0.0]	006	4	14:00:07	80	24
23	KC3BN	[0.0.0.0]	007	2	05:42:41	80	24
24	WA3KXG-6	[0.0.0.0]	007	2	05:42:41	40	
25	KA4USE	[0.0.0.0]	003	0	15:57:57	115	14
26	TEST	[0.0.0.0]	000	1	00:00:00	110	9
27	K4NGC	[0.0.0.0]	007	0	15:14:51	40	
28	KA3KIW	[0.0.0.0]	007	1	11:39:26	85	29
29	KA3DBK	[0.0.0.0]	007	2	16:21:08	40	
30	K3SLV	[0.0.0.0]	007	1	13:17:19	40	
31	W3HCE	[0.0.0.0]	000	3	00:00:00	80	30
32	W3VH	[0.0.0.0]	007	0	12:49:21	40	
33	KE4TZ	[0.0.0.0]	003	1	13:11:27	90	29
34	WA4QNO	[0.0.0.0]	000	1	00:00:00	165	5 7 35
35	K4UMI-5	[0.0.0.0]	002	1	14:43:26	120	5 7
36	WB4FJI-5	[0.0.0.0]	002	1	14:45:41	80	27
37	WA4SZK	[0.0.0.0]	000	1	00:00:00	210	5 7 38 39
38	K4LKQ-1	[0.0.0.0]	002	1	14:46:39	120	5 7
39	W4ULH-1	[0.0.0.0]	002	1	14:46:39	165	5 7 38
40	WB4FQR-4	[0.0.0.0]	006	1	15:05:25	75	27
41	N4SN	[0.0.0.0]	007	0	15:47:25	145	1

```
42   KX3C          [0.0.0.0] 002  2    16:21:08    40
```

Figure 1. Candidate Node Table

Figure 2 illustrates a candidate node table showing the from-NID, to-NID and associated information for each link in the order collected. In the Flags field, which is in octal format, bit 1 (numbering from the rightmost bit, which is bit 0) is the heard bit, bit 2 the synchronized bit and bit 7 the reciprocal bit. The remaining bits and fields can be ignored.

From	To	Flags	Age	From	To	Flags	Age
1	0	002	3	1	4	002	3
5	0	002	104	5	7	007	104
7	6	006	255	10	0	002	19
8	10	207	15	10	9	207	43
9	1	207	4	1	11	000	41
12	1	003	8	1	14	206	8
14	13	003	8	14	0	002	40
1	10	002	4	10	15	002	4
10	13	002	57	12	0	002	237
16	0	002	72	16	13	003	72
5	17	003	255	18	0	002	15
18	10	207	15	10	20	006	87
20	19	207	87	18	9	003	255
19	10	006	87	21	22	207	146
22	10	206	146	10	21	004	255
24	0	002	255	23	22	007	255
22	24	206	255	24	23	207	255
23	9	006	255	9	22	006	146
25	14	203	40	18	1	003	15
9	26	002	255	9	8	006	43
27	1	207	78	27	0	002	79
29	0	002	19	28	29	007	255
29	1	207	62	1	28	006	255
30	0	002	185	30	31	007	185
32	0	002	211	32	1	207	211
29	18	207	72	33	29	003	191
29	14	202	191	14	33	002	196
18	20	203	157	18	8	203	158
9	0	002	152	5	10	003	109
10	31	002	109	5	1	003	109
5	31	003	108	5	30	003	108
7	35	002	107	35	34	002	107
27	36	003	104	36	9	002	104
27	14	207	81	14	9	006	40
7	38	002	104	38	39	002	104
39	37	002	104	27	40	007	87
40	1	206	83	41	1	207	49
29	42	207	19	42	0	002	19

Figure 2. Candidate Link Table

The following example shows how Wiretap operates to compute the optimum route with respect to the factor computations and weights previously described. The example also shows how the procedure reacts to congested nodes by routing around them.

The route to be computed involves the Wiretap station W3HCF (NID 0) and station AK3P (NID 21). As it turns out, the latter is not direclty reachable from W3HCF, but is indirectly reachable via other stations, including W3IWI (NID 9), WB4APR-6 (NID 10), AK3P-5 (NID 22) and WA3KXG-6 (NID 24). Some possible paths that might be considered include those in the following diagrams (the NID is shown above the node and the complexity factor below):

```
          (0)     (10)    (21)
    (1)   o-------o-------o
          0    9    0

          (0)     (24)    (22)    (21)
    (2)   o-------o-------o-------o
          0    2    4    0

          (0)     (9)     (22)    (21)
    (3)   o-------o-------o-------o
          0    6    4    0
```

A minimum-hop algorithm would chose the first path (1) as the optimum on the basis that it has the least number of hops; however, node 10 is a very busy digipeater and is often congested, as suggested by the complexity factor of 9. The other two paths (2) and (3) are one hop longer, but have lower complexity factors. Actually, the choice can go either way depending upon the link factors, which are not shown in the diagrams.

Following is the result of a step-by-step analysis of the routing algorithm as it constructs the optimum route. The contents of the list used by this algorithm are shown at each step along with the factors used to calculate the path weight. The Incr field shows the incremental weight computed for the entry, while the Total field shows the accumulated total path weight. Only the From, To and Total fields are actually stored in the list.

First, the algorithm scans the link table for links leading to the destination 21, which results in two entries in the list:

From	To	f0	f1	f2	f3	f4	Incr	Total
22	21	30	0	0	0	0	30	30
10	21	30	15	5	0	0	50	50

Since the Wiretap station 0 is not found in the From field, the link table is scanned again for links leading to 22, which causes the following entries to be added to the list:

10	22	30	0	0	0	20	50	80
23	22	30	0	5	0	20	55	85
24	22	30	0	0	0	20	50	80

9	22	30	0	5	0	20	55	85

The link table is scanned again for links leading to 10, which causes the following entries to be added:

0	10	30	0	5	5	45	85	135
8	10	30	0	0	0	45	75	125
9	10	30	0	0	0	45	75	125
1	10	30	0	5	5	45	85	135
15	10	30	0	5	5	45	85	135
13	10	30	0	5	5	45	85	135
18	10	30	0	0	0	45	75	125
20	10	30	0	5	0	45	80	130
19	10	30	0	5	0	45	80	130
5	10	30	0	5	5	45	85	135
31	10	30	0	5	5	45	85	135

The result is a complete path of total weight 135, which is up to this point the minimum-weight complete path. However, the algorithm may yet find a complete path of less weight. The next entry in the list is 10, which has already been processed, so the algorithm tries the next entry 23, which has not been processed, and then entry 24 after that, which results in the following additions to the list:

9	23	30	0	5	0	10	45	110
24	23	30	0	0	0	10	40	95
0	24	30	0	5	5	10	50	130

Another complete path has been found, this one of total path weight 130, which is now the minimum of all found so far. Continuing, the algorithm scans the link table for links leading to 9 and adds the following:

1	9	30	0	0	0	30	60	145
18	9	30	0	5	5	30	70	155
26	9	30	0	5	5	30	70	155
8	9	30	0	0	5	30	65	150
0	9	30	0	5	5	30	70	155
36	9	30	0	5	5	30	70	155
14	9	30	0	0	5	30	70	155

All of these paths have total weights greater than 130 and thus can never lead to a complete path of weight less than that. Inspection of all remaining entries in the list show that none of them can lead to a complete path of weight less than 130, so the algorithm terminates at this point with the declaration that the (reversed) optimum route is (2) in the diagram above. It remains to be shown, however, that this route is indeed superior to the minimum-hop route, but this can be determined only by experiment.

Data Base Housekeeping

As apparent from the example, Wiretap tends to pick up a good deal of what might be called routing trash on the channel. It can happen that a station may call any other station whatsoever, with the result that Wiretap may pick this

up and add speculative links to the data base. In practice, this happens reasonably often as operators try various heuristic routes to stations that may be shut down, busy or blocked by congestion. Nevertheless since Wiretap operates entirely by passive monitoring, speculative links may represent the principal means of discovery of new paths.

The number of speculative links can be expected to grow without limit as the Wiretap station continues to monitor the channel. Eventually some sort of garbage collection will be required, possibly based upon an activity timer. The prototype implementation includes in every link table entry an activity timer represented as a counter that is incremented once each minute and reset to zero when the link is found in a monitor header. The intent is that, should this counter exceed a threshold, say fifteen minutes, and the link is not marked heard on either direction or synchronized, the link should be purged from the data base. If this results in an isolated node; that is, one not represented by any to-NID or from-NID in the link table, the node is purged as well.

It is possible that a more agressive purging policy may be required for exceptionally busy channels, especially if operation using active probes or third-party routing is implemented. An effective way to manage this is on the basis of the link factors, their weights and the activity timers, with the rule that, among links with the highest weighted sum of link factors, the one not heard for the longest time should be the first one purged from the data base. Other heuristics may be useful as well.

Summary and Directions for Further Development

Wiretap represents an initial experiment and evaluation of the effectiveness of passive monitoring in the management of the packet-radio channel. While the results of initial experiments have been encouraging, considerable work needs to be done in the optimization of factor computations and weight assignments. For this to be done effectively, some experience needs to be gained in the day-to-day operation of the prototype system during which various combinations of weight assignments can be tried.

The next step in the evolution towards a fully distributed routing algorithm is the introduction of active probing techniques. This should considerably improve the capability to discover new paths, as well as to fine-tune existing ones. It should be possible to implement an active probing mechanism while maintaining compatibility with the passive-only Wiretap, as well as maintaining compatibilty with other stations using no routing algorithms at all.

A particularly difficult area for any routing algorithm is in its detection and reponse to congestion. Some hints on how the existing Wiretap mechanism can be improved are indicated in the text. Additional work, especially with respect to the hidden-station problem, is necessary.

It is quite likely that the most effective application of routing algorithms in general will be at the local-area digipeater sites. One reason for this is that these stations may have off-channel trunking facilities that connect different areas and may exchange wide-area routing information via these

facilities. The routing information collected by the local-area Wiretap
stations could then be exchanged directly with the wide-area sites.

From -8129985893511025413
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,da594528c4db1a3e
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-30 19:35:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site brl-sem.ARPA
Path: utzoo!linus!philabs!cmcl2!seismo!brl-tgr!brl-sem!ron
From: ron@brl-sem.ARPA (Ron Natalie <ron>)
Newsgroups: net.ham-radio.packet
Subject: Re: Q Street on TNCs
Message-ID: <466@brl-sem.ARPA>
Date: Wed, 30-Oct-85 22:35:00 EST
Article-I.D.: brl-sem.466
Posted: Wed Oct 30 22:35:00 1985
Date-Received: Sun, 3-Nov-85 07:37:19 EST
References: <254@mit-eddie.UUCP>
Organization: Ballistic Research Lab
Lines: 8

> From: Ron Natalie <ron@BRL.ARPA>

I don't know who's responsible for gatewaying the list to
the USENET, it seems to be happening at mit-eddie. But it
would be nice if it didn't stick in the superfluous from
line and that it wouldn't set the Organisation field to MIT.

-Ron

From 5864028501293424670
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f3f8f9b715627c54
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-31 07:43:46 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84 exptools; site ihlpg.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!ihlpg!retzner
From: retzner@ihlpg.UUCP (Retzner)
Newsgroups: net.ham-radio.packet
Subject: Re: General questions on packet
Message-ID: <1392@ihlpg.UUCP>
Date: Thu, 31-Oct-85 10:43:46 EST
Article-I.D.: ihlpg.1392
Posted: Thu Oct 31 10:43:46 1985
Date-Received: Sat, 2-Nov-85 04:37:57 EST
References: <1260@sphinx.UChicago.UUCP>
Organization: AT&T Bell Laboratories

Lines: 56

>   1) Where can I get lots of information about it? The only
>   documentation I have so far is the November CQ magazine.
There have been some "introductory" articles in recent issues of
QST. Detailed information is available, just not in one place.
Here are some national organizations for possible sources:

     AMRAD
     P. O. Drawer 6148
     McLean, VA 22106-6148

     AMSAT
     850 Sligo #601
     Silver Spring MD 20910
     301-589-6062

     Tucson Amateur Packet Radio (TAPR)
     P. O. Box 22888
     Tucson, AZ 85734-2888

     ARRL
     Newington, CT 06111
>
>   2) What is the maximum size of an AX.25 packet?
>
AX.25 is limited to 128 bytes of data in a packet.

>   3) What plans are there for the next level of network software
>   to be add to the basic network layer of error checking
>   packet communications that has been provided by AX.25.
>
These plans are currently in the works. There are small groups all
over the country looking into this, some are playing with their own
implementations. This is one of the main concerns of TAPR now.

>   4) Why has the FCC limited H.F. data transmission rates to 300
>   baud? I'm aware of the the limits on 2 meters and above.
>
In a word, bandwidth. Higher baud rates (frequency response) requires
more bandwidth. More sophisticated modem techniques could cram more
data into the available bandwidth (i.e. 212a), but at higher costs.

>   5) I'm particularly interested in H.F. (D.X.) packet radio. How
>   much success has been made on the long distance bands?
>   I'm aware of the digirepeater capabilities of most of the
>   packet boxes, however I'm thinking more of long distance
>   point to point transmission because of the sacrificed speed
>   that digirepeating inherently requires.
>
There are people using it. Some computer equipped sites have "gateways"
that connect a VHF TNC to an HF TNC. Others have experimented with
OSCAR satellites.

Hope this is of some help to the net.

Bill Retzner WB9QXJ
ihnp4!ihlpg!retzner

From 55930632833298763
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,f3f8f9b715627c54
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-10-31 22:44:00 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/18/84; site petrus.UUCP
Path: utzoo!watmath!clyde!burl!ulysses!ucbvax!decvax!bellcore!petrus!karn
From: karn@petrus.UUCP (Phil R. Karn)
Newsgroups: net.ham-radio.packet
Subject: Re: General questions on packet
Message-ID: <667@petrus.UUCP>
Date: Fri, 1-Nov-85 01:44:00 EST
Article-I.D.: petrus.667
Posted: Fri Nov 1 01:44:00 1985
Date-Received: Sun, 3-Nov-85 05:47:51 EST
References: <1260@sphinx.UChicago.UUCP>
Organization: Bell Communications Research, Inc
Lines: 73

> I have a few questions regarding the current state of packet radio.
>
>   1) Where can I get lots of information about it? The only
>   documentation I have so far is the November CQ magazine.

What kind of information are you looking for? Offhand, I can suggest
the following for starters:

1. The AX.25 Level 2 Version 2 protocol specification
2. Proceedings from the four ARRL-sponsored Amateur Digital Communications
conferences

Both of the preceeding items are available from the League.

>   2) What is the maximum size of an AX.25 packet?

The spec says an I-frame may contain a maximum of 256 bytes. Most of
the actual implementations, however, use a contiguous ring buffer so
it is the total amount received that matters, not the size of each
frame. In some (e.g., the code I wrote for the Xerox 820) the buffers
are on linked lists, and the size allocated for each one is an operator
parameter.

>   3) What plans are there for the next level of network software
>   to be add to the basic network layer of error checking
>   packet communications that has been provided by AX.25.

No other issue within packet radio has generated more intense and prolonged controversy than this question. There are perhaps three schools of thought: those who want to base the upper layers on a virtual circuit protocol patterned after X.75, the CCITT's standard for public packet network interconnection; those who prefer a datagram approach, i.e., the DoD/ARPA standard TCP and IP protocols; and those who couldn't care less but just want to use something without worrying about the details. Side issues, such as the proper placement of the various protocol modules and the need for TNC software enhancements, are also quite controversial.

The amateur packet radio protocol debates are a perfect miniature of past debates in packet switching as a whole, and most of the arguments are the same.

Since I am one of the major protagonists in this debate, I will refrain from soapboxing unless I am deliberately provoked.

> 4) Why has the FCC limited H.F. data transmission rates to 300
> baud? I'm aware of the the limits on 2 meters and above.

Probably for bandwidth reasons, since FSK has to run in the CW bands on HF. Personally, I have very little faith in high speed HF data transmission because of the severe multipath disperson problems, but I may be biased because of my involvement with the amateur satellite program.

> 5) I'm particularly intersted in H.F. (D.X.) packet radio. How
> much success has been made on the long distance bands?
> I'm aware of the digirepeater capabilities of most of the
> packet boxes, however I'm thinking more of long distance
> point to point transmission because of the sacrificed speed
> that digirepeating inherently requires.

There has been moderate success over very long paths (i.e., Maryland to New Zealand) on 10 meters when the band conditions are right. It is best to operate on frequencies just under the MUF in order to reduce the aforementioned dispersion problems.

I should point out here that a major shortcoming of amateur packet radio is in RF modem technology. The modems that are used are extremely non-optimal in terms of bandwidth and power efficiency, and much improvement could be gained if a talented and determined group were to really take this job on. The use of minimum shift keying (MSK) has been proposed for HF and some work has been done on a prototype, but progress has been slow. The same is true with a PSK modem for satellite work.

Phil Karn, KA9Q

From 8724675488738499969
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,4969c3be74c99c7e,start
X-Google-Attributes: gid11bd51,public

X-Google-ArrivalTime: 1985-11-01 11:04:51 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!jmitchen@wsmr07.arpa
From: jmitchen@wsmr07.arpa
Newsgroups: net.ham-radio.packet
Subject: Software for Mac?
Message-ID: <275@mit-eddie.UUCP>
Date: Fri, 1-Nov-85 14:04:51 EST
Article-I.D.: mit-eddi.275
Posted: Fri Nov 1 14:04:51 1985
Date-Received: Sun, 3-Nov-85 14:57:14 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 7

From: John Mitchener PO <jmitchen@wsmr07.arpa>
I understand that there is software available for the Macintosh for use
with packet radio. Can anyone provide details or a reference to more
information. Thanks in advance.

John Mitchener
WB5PJR

From 19915999778319984 48
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,a6d6ae3769d2a1cb,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-01 13:27:14 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 (Tek) 9/28/84 based on 9/17/84; site tekigm.UUCP
Path: utzoo!watmath!clyde!cbosgd!ihnp4!drutx!mtuxo!mtunh!vax135!cornell!uw-beaver!
tektronix!tekig3!tekigm!alanr
From: alanr@tekigm.UUCP (Alan Rovner)
Newsgroups: net.ham-radio.packet
Subject: For Len, KF8J, no need to panic..
Message-ID: <606@tekigm.UUCP>
Date: Fri, 1-Nov-85 16:27:14 EST
Article-I.D.: tekigm.606
Posted: Fri Nov 1 16:27:14 1985
Date-Received: Mon, 4-Nov-85 03:02:04 EST
Distribution: net
Organization: Tektronix, Beaverton OR
Lines: 13

Here are some hints on what you will need to talk to your TNC-2 Len.
Yes you will need some sort of serial card. Just about any on the market
will do. I'm using a CCS7710A which I'm not sure if this card is still
manufactured or not. Also you will need some sort of terminal software.
Again almost any will do. I have personal experience with three programs
written by the same manufacturer used by three different operating systems
on the Apple. Ascii Express works under Apple DOS, Pterm works under

Apple Pascal and Zterm works under Apple CP/M. Of course to use the CP/M
version you need some sort of Z80 card. These three programs are virtually
indentical in their features and functions. That's all you need other than
a RS-232 cable. Incidentally, I'm using an Apple II+ and an old TNC-1.
Good luck and happy packeting.
Al WA2TMP, Vancouver, WA

From 5118535675219590755
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,677ac8538dbb80f4,start
X-Google-Attributes: gid11bd51,public
X-Google-Thread: 151e61,677ac8538dbb80f4,start
X-Google-Attributes: gid151e61,public
X-Google-ArrivalTime: 1985-11-02 08:44:15 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.2 9/5/84; site anasazi.UUCP
Path: utzoo!linus!philabs!cmcl2!seismo!hao!noao!terak!anasazi!john
From: john@anasazi.UUCP (John Moore)
Newsgroups: net.ham-radio,net.ham-radio.packet
Subject: Re: Re: Help with Kantronix Packet
Message-ID: <324@anasazi.UUCP>
Date: Sat, 2-Nov-85 11:44:15 EST
Article-I.D.: anasazi.324
Posted: Sat Nov 2 11:44:15 1985
Date-Received: Tue, 5-Nov-85 06:43:13 EST
Reply-To: john@anasazi.UUCP (John Moore)
Organization: Anasazi, Phoenix Az.
Lines: 46
Keywords: Kantronix Packet
Xref: linus net.ham-radio:2890 net.ham-radio.packet:114

I tried to send this by mail, but it bounced somewhere near ARPA land.

In article <2438@brl-tgr.ARPA> you write:
>Please note the manual supplied is a USERS manual, NOT a
>TECHNICAL/SERVICE manual. The manual is complete with full detailed
>descriptions of commands and control. It's internal memory can be
   Since we're all supposed to be appliance operators, I suppose that
this is okay?? Come on. Packet is still experimental in amateur operation.
Even my Kenwood TS-430, a far more complicated appliance, comes with
more technical information that the Kantronix. Also, in an emergency,
I would rather be able to fix my appliance!

>The fact that you wasted several hours during a critical emergency net
>time only shows how important it is to be prepaired!   Participate in

A slight problem here: My own equipment could not be brought into
Mexico, so we had to do with what we could get. Were you prepared for
the Mexico disaster? Where were you?

>The syndrome was "...we couldn't get it to receive anything."; perhaps
>the problem was a shorted audio mini-jack? Dead/inop AC outlet/power

>supply? Not enough receive level/audio? Incomplete/inop software?   I

     Since neither Carlos nor myself are idiots (or appliance operators),
we of course eliminated all of these problems (and many more) early on.

     So, now that you have criticized the fact that we had problems,
how about a little help on the Kantronix. What is that big "WORLD" chip?
What pins are what?

--
John Moore (NJ7E/XE1HDO)
{decvax|ihnp4|hao}!noao!terak!anasazi!john
{hao!noao|decvax|ihnp4|seismo}!terak!anasazi!john
(602) 952-8205 (day or evening)
5302 E. Lafayette Blvd, Phoenix, Az, 85018 (home address)

--
John Moore (NJ7E/XE1HDO)
{decvax|ihnp4|hao}!noao!terak!anasazi!john
{hao!noao|decvax|ihnp4|seismo}!terak!anasazi!john
(602) 952-8205 (day or evening)
5302 E. Lafayette Blvd, Phoenix, Az, 85018 (home address)

From -7002717494494991389
X-Google-Language: ENGLISH,ASCII-7-bit
X-Google-Thread: 11bd51,31c8a5c6bfa0443d,start
X-Google-Attributes: gid11bd51,public
X-Google-ArrivalTime: 1985-11-02 18:44:07 PST
Relay-Version: version B 2.10 5/3/83; site utzoo.UUCP
Posting-Version: version B 2.10.1 6/24/83; site mit-eddie.UUCP
Path: utzoo!linus!philabs!cmcl2!harvard!think!mit-eddie!@DCN6.ARPA:mills@dcn6.arpa
From: @DCN6.ARPA:mills@dcn6.arpa
Newsgroups: net.ham-radio.packet
Subject: Comes now the local-route option
Message-ID: <297@mit-eddie.UUCP>
Date: Sat, 2-Nov-85 21:44:07 EST
Article-I.D.: mit-eddi.297
Posted: Sat Nov 2 21:44:07 1985
Date-Received: Tue, 5-Nov-85 08:01:30 EST
Sender: daemon@mit-eddi.UUCP
Organization: MIT, Cambridge, MA
Lines: 153

From: mills@dcn6.arpa
Gents,

I sense we need to clear a few sinuses here. The issue is how to assign
Internet addresses so that somehow we can make the AX.25 packet-radio channel
safe for Internet end systems. Note that I take AX.25 as given with the

assumption that datagram service is available in addition to virtual-circuit service, but that neither is exclusive.

We already have an excellent generator of random but unique identifiers as our assigned individual callsigns, but these are useless for routing purposes. Nevertheless, unique identifiers are so precious in the network world that we would be foolish to abandon the use of callsigns as local-net (AX.25) addresses.

The Internet address space has already been sculpted at three levels: net, subnet and host, which makes it convenient for at least upper-level routing. It is inviting to map every callsign into a unique Internet address, but there isn't enough practical real estate to do this without doing violence to one or more of these levels.

In order to realize the inherent routing capability of the Internet address, while allowing some degree of station mobility, the binding of local-net addresses (callsigns) to Internet addresses cannot be established on a permanent basis and may change from time to time. While this could be handled in principle by some responsive administrative body, it would be far better to establish some procedure that could do this automatically. The procedure should be designed so it would work in the absence of automated assistance, for instance by mutual cooperation among the local users. Eventually, the procedure should become part of the channel-access protocol architecture.

If the primary incentive to adopt Internet addressing is to facilitate wide-area routing, then the primary decomposition of nets and subnets should be on the basis of the geographical locations and coverage areas of the gateways. If the AX.25 community is to be integrated to any degree with any part of the existing Internet it would be a fatal mistake to use a single net number everywhere, regardless of the use of subnets, because that would allow only a single port of entry to the AX.25 community. Datagrams sent from Stanford U could easily fly to a gateway in Washington, DC, and then swim laboriously back across the AX.25 continent to a station in Palo Alto. The decomposition and net-number issues need more study.

Presumably, individual stations can be homed to one or more gateways and gateways can serve more than one net in an area. Nevertheless, since the primary function of the Internet address is to facilitate routing to the eventual destination, the end result of the binding should be to associate each station with the net having the best first-hop gateway on the path to most destinations.

Let's assume that some hosts serving a particular net or subnet in an area collectively manage the space of host addresses for that net or subnet and are prepared to hand out unique Internet addresses on demand. Every player using Internet (not necessarily all players) could not only request assignment of an Internet address, but could learn the assignment of other players as well. This must be done with a reliable, distributed protocol, since the result will be that, for at least a time, all gateways and hosts serving that net must know how to reliably construct the AX.25 address from the given Internet address.

Binding protocols (ARP and Reverse ARP) which could serve the above purposes have been developed for diskless Ethernet workstations; however, the characteristics of Ethernets and AX.25 channels are far different, most dramatically in that the channel is far less robust and not all stations can hear each other. We leave the development of such a protocol as an exercise for the gateway system implementors and concentrate on how to do this manually for the near future.

The easiest and most obvious way is simply using a data base (file) maintained at designated BBS sites and copied occasionally by individual stations, much like the famous Internet file HOSTS.TXT is often used now. A pointer to this file could be advertised in beacons broadcast by that BBS. The table would be maintained informally, either cooperatively or by a designated referee. A station would become registered on a particular net by request and be confirmed by periodic re-registration requests thereafter. It would be de-registered if not re-registered within a renewal interval. In priniciple, a station could be registered on any nets served by gateways it can work, directly or indirectly; however, some mechanism may be necessary to discourage heroic paths.

Using this simple scheme, how does a station in one net learn the Internet address of a station in another net? There are two ways to approach this problem. One is using domain nameservers as implemented by many Internet systems, including all likely to be reachable via AX.25. The domain nameserver provides the Internet address(es) and related information for a set of names registered in its data base. The data base is hierarchically partitioned with provisions for distributed update, backup and access from anywhere.

Domain registration procedures and nameservers exist now all over the ARPANET centric Internet and at some trouble spots in the MILNET centric Internet. In principle we could register one or more domains and subdomains, for example AX25.ORG (!), and hijack a couple of Unix systems to run nameserver interference. We then cajole the hijacker(s) to update the hijackee(s) occasionally in response to electronic mail, which could of course originate on either side of the AX.25 gateways. I might wind up W3HCF.AX25.ORG as an alias for my beloved gateway/fuzzball DCN6.ARPA.

In principle, domain nameservers could be accessed from within the AX.25 community as well, whether implemented on the AX.25 side of the gateways or not. It would certainly be feasable to operate a domain nameserver on any particular net, probably homed to a gateway; however, the AX.25 community is at present highly fragmented and can not be expected at the present time to provide a community-wide name-address translation service without outside help. I have a much more radical interim proposal designed to bridge the gap between the present chaos and the time such services are viable from anywhere in the AX.25 community.

In the Internet architecture there are two reserved values in the net, subnet and host fields. The "broadcast" address consists of all ones in a field, while the "unspecified" address consists of all zeros. Ones in the host field means to broadcast to all hosts on the subnet, while ones in the subnet field means broadcast to all subnets on the net. Ones in the network field is considered rude and wouldn't work anyway. The use of zeros in the net, subnet

and host fields usually is interpereted as "don't know," which is useful for various address-resolution procedures. Of course, no host or gateway should be assigned these as their primary addresses.

My radical proposal involves a new Internet option called the local-route option. This option is operative only when a datagram with zeros in the host field appears at the destination gateway and is net-specific. The destination gateway is expected to construct the local-net address from the information in the option, which might override information it already has. In the case of AX.25 gateways, the option would take the form of an ASCII string containing at least the destination callsign and maybe the digipeater route.

Let's say a station in an area not served by a domain nameserver wishes to contact another station in some other area. Using a map or some other means a list of nets serving that area is constructed. The station then selects one of these net addresses with zeros in the host field and inserts the local-route option containing the destination callsign. If the datagram can be punched through whatever network plumbing exists to reach the destination gateway, that gateway simply copies the local-route text into the frame header and tosses the datagram on the channel. If no response is heard the originator can try another net. Hopefully, the size of the list of nets is small, so that the number of alternate paths is manageable.

This mechanism will work only in a participating host that provides the local-route option; moreover, it requires every participating host to be multiply-homed on both the unspecified co-address and any other specific addresses it has. In principle, these obstacles can be overcome easily in new IP/TCP implementations built especially for the AX.25 channel and maybe even in some existing ones. Fuzzballs already recognize the unspecified co-address and could be taught the local-route option in a few minutes.

No Internet gateways other than those serving AX.25 nets and subnets will need to know or care about the proposed mechanism. It can be implemented almost trivially in the simplest AX.25 gateway that has fixed net-routing tables and no other topological knowledge. Again note the mechanism is intended only for use during a transitional period until the AX.25 community develops a degree of cohesiveness and robustness sufficient to support reliable domain nameservers.

Dave